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RICHARD P. ROTHWELL, C.E., M.E., ROSSITER W. RAYMOND, Ph.D., M.E., } Editors.

**Cable Address: "Rothwell," New York.**

Books for review and all communications for the JOURNAL should be addressed, Managing Editor, P.O. Box 1833, New York.

Communications for Mr. RAYMOND should be addressed to ROSSITER W. RAYMOND, P.O. Box 1465, New York. Articles written by Mr. Raymond will be signed thus *: and only for articles so signed is he responsible.

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MR. JOHN R. DUNLAP, who, for a year past, has very efficiently managed the business department of the ENGINEERING AND MINING JOURNAL, has resigned this position to take charge of the business department of the New York *Standard*. Mr. DUNLAP takes with him the esteem and warm good wishes of all his former associates. The general business management of the ENGINEERING AND MINING JOURNAL will hereafter be conducted by Mr. R. P. ROTHWELL, President of the Scientific Publishing Company.

THE Rio Tinto Company, which produced about 26,000 long tons of copper last year, has just declared an interim dividend amounting to £325,000, which means that in the half year it has made a profit not far short of $2,500,000, if due provision has been made out of the profits for interest and sinking fund on the company's bonds, which item amounts to about £140,000. This is the property which the Spanish Government could not work profitably, and consequently sold to an English company, and this when in the year of sale (1873) the average price of Chili bars was £85 a ton and the average price of that and the preceding seven years, during which the poor management of the Spanish Government found it unprofitable to work, was £74 10s. This is an illustration of government mine management.

## THE FAR TRANSMISSION OF POWER.

The principal methods in use for the transmission of energy to any considerable distance from the prime motor may be classified as follows:

1. By wire ropes.
2. By compressed air.
3. By water under pressure.
4. By hot water to be converted into steam at the point of application.
5. By steam, for the most part at low pressures for heating purposes.
6. Electric conductors.

The transmission by means of wire ropes, first applied on a large scale at Schaffhausen on the Rhine, has been successfully applied in many places in this country to moderate distances. Under suitable conditions the results have been very economical. They are so well known it is scarcely necessary to refer to them now, but we shall in early numbers of the ENGINEERING AND MINING JOURNAL give our readers such information as will make them acquainted with the most recent practice in this as in the other systems.

On another page we tell, on the authority of Mr. E. B. ELLINGTON, M. I. C. E., what has been done in London with the hydraulic distribution of power.

It is but natural that the data concerning any new system are usually given by its advocates and generally by those pecuniarily interested in securing its adoption. Nevertheless we shall be able in a future number to give a general comparison of advantages and disadvantages of each system which may guide those who have not the opportunity for making investigations themselves, in measuring the economic results attained.

## THE USE OF STEEL SUPPORTS IN MINING.

Since our remarks in our last issue on the use of steel in place of timber in mining, we have received a fresh illustration of its successful application for this purpose. In a paper recently read by Mr. A. L. STEAVENSON, M.E., before the North of England Institute of Mining Engineers, it was stated that the result of a trial on a large scale of steel beams in the iron mines in the Cleveland district was entirely favorable to their adoption from the points of both economy and security.

In the mines in question the expenditure for timber is about $50,000 a year, even when not working full time, and the average life of the timber in consequence of dampness was not more than two years. Out of nearly 200 tons of steel now in use only one beam has failed, and it is demonstrated clearly that in strength the advantages gained where the roof is heavy are marked, fewer pieces being required and a much better and neater arrangement can be effected with a clearer road, owing to the smaller size and number of the props. After an experience of three years and a half the work seems to be in perfectly good condition, so that permanence is effected in place of frequent renewals. Including the packing material and all labor, the average cost of six steel board-end crossings was £5 4s. 1d., as against £3 16s. 6d. for timber, or an increase of 36 per cent, which increased cost is considered amply compensated by the advantages gained.

We have previously referred to the waste of our forest resources, and the question is one of such vital importance to the nation that, in drawing attention again to the subject we will quote from the last report of Mr. B. E. FERNOW, Chief of the Forestry Division in the Department of Agriculture: "It is now safe to say that the annual consumption of wood and wood products is at least double the amount reproduced on our present forest area."

"It has become evident that the consequences of forest devastation reduce fertile lands to barrenness, prosperous communities to poverty."

## THE DISCRIMINATION AGAINST ANTHRACITE IN TRANSPORTATION CHARGES.

The protests of some of the anthracite mining companies against the railroads for discriminating against them, to which we have several times called attention, has progressed a very important step further. This is in the form of a petition by COXE BROTHERS & CO. to the Inter-State Commerce Commission, in which it is shown very clearly that the Lehigh Valley Railroad Company not only discriminates against anthracite and in favor of bituminous coal, carrying the latter at about one half the rate per ton-mile that it does the former; but the petition also shows that the railroad company favors the Lehigh Valley Coal Company, of which it is the owner, in such a manner as to give it control of the market, enabling it to underbid its competitors in the market.

These are question of far-reaching importance to the trade, and so closely affect the interests of the other transportation companies that now monopolize the anthracite traffic, that we doubt if they will be allowed to come to a formal decision by the Inter-State Commission. Under the present reign of trusts, combinations and monopolies the result that might naturally be expected would be the buying out of those concerns that may make themselves unpleasant, and are rich enough to fight and cannot be silenced or

"frozen out." That the Coxe case will be pushed in absolute good faith is assured by the character of the complainant; and that it will be effectively carried on is assured by the remarkable ability of Mr. FRANKLIN B. GOWEN, counsel for the plaintiffs, and by his success in the similar case of discrimination made by the railroads in favor of the Standard Oil Company.

The claim of Messrs. COXE BROTHERS is that anthracite coal should be carried at the same rates as bituminous coal "carried contemporaneously with anthracite coal, and substantially under similar circumstances and conditions." In other words, the question must finally come down to the demand that all sizes of anthracite coal should be carried at the same rate per ton-mile as bituminous coal carried under similar conditions. And since the average distance from the Lehigh and Mahanoy anthracite fields to New York harbor is about 149 miles, and that from the Wyoming field is about 171 miles, as against 295 miles from the Snow Shoe bituminous coal-field, if the mile-ton rate for transportation were the same, the price of anthracite would be greatly reduced, for that of bituminous coal is regulated by the cost of bringing it to market from other districts and over other lines that cannot be controlled in this manner.

If this principle be once established, the cost of anthracite in the New York market would be lessened 75 cents to $1 a ton, or, say, 25 per cent, with corresponding reduction in the profits of the coal carriers.

There is a general impression that the Inter-State Commission will decide substantially in favor of the plaintiffs in this case should it go before them. It has, therefore, become one the most immediately important questions in the trade, and we shall follow its evolution with great interest.

## THE MITCHELL MONUMENT.

An interesting address, delivered on the 16th instant by Dr. WILLIAM B. PHILLIPS before the University of North Carolina, describes the erection of a monument on Mitchell's High Peak, N. C., in memory of ELISHA MITCHELL, D.D., for 39 years a professor in that university.

American scientists of middle age will remember that Professor MITCHELL lost his life on the 27th of June, 1857, while engaged in measuring the heights of the peaks of the Black Mountains, in Yancey County, N. C. He had left his party about half-way up the highest peak, with the intention of crossing the mountain alone and on foot, to visit an old guide with whom, on a former occasion, he had made the ascent. By some fatal mishap, the particulars of which must remain forever unknown, he fell over a precipice into a deep pool of water, and (probably rendered helpless by the fall) was drowned. His body was found after a careful search lasting ten days. It was interred first at Asheville, N. C., and from this place was subsequently removed to the top of the highest peak, where it was buried June 16th, 1858.

Since that time, several attempts have been made to secure the erection of a monument to his memory on the spot where he had been finally laid to rest; but, for one cause or another, these plans came to nothing, and the breaking out of the war, followed by years of distracting excitements, caused the matter to be comparatively forgotten by the public. Recently, however, the surviving members of Professor MITCHELL'S family have become able to revive and carry out the project. Affection has paid the debt for which Science and Patriotism should have been equally liable. Dr. PHILLIPS was charged with the execution of the work, and erected, during the summer just passed, a plain shaft of white bronze at the grave.

This peak, which now bears Dr. MITCHELL'S name, was first measured by him in 1844, and found to be 6711 feet above sea-level. A subsequent measurement, which he made in 1856, gave 6700 feet. The United States engineers, in 1881-2, reduced this determination to 6688 feet. It is beyond doubt the highest point in the United States, east of the Mississippi River. The ascent is best made from Patton's, on the Swannanoa River, from which point the distance to the summit is about 12 miles. Mere figures of altitude give no conception of the difficulty of the ascent, and especially of the transportation of heavy freight. Dr. PHILLIPS'S work was really a piece of engineering by the use of "main strength," worthy to be ranked with some of the feats of war-times, in the movement of artillery over "impossible" ground.

The monument was cast by the Monumental Bronze Company, of Bridgeport, Conn., in nine sections, with interior bolts of copper and brass. The total weight is 900 pounds; the weight of the heaviest piece, 140 pounds. As it now stands, it presents a pyramid, 3 feet square at the base and 9 feet high.

"White bronze," as manufactured by the works above named, is almost pure spelter, containing only a few tenths of one per cent of ingredients other than zinc. After casting, it is treated with the sand-blast, to impart a finely granular surface, closely resembling, in texture and color, light-gray granite. It is practically weather-proof, years of exposure only darkening somewhat its original hue.

A good deal of trouble was encountered i securing a firm foundation, the rock of the peak being a coarse and very friable gneiss. Two stones, weighing about 1800 pounds, were united for this purpose with Portland cement. The structure is anchored to these by eight ¾-inch copper bolts and four 1-inch zinc bolts, screwed into the first and third sections and secured to the stones by metal pourings. These anchors extend 4 inches into the bed-rock. All the bolts are fastened from within, so that they do not show on the outside.

It was hauled by wagon from Black Mountain station on the Western North Carolina Railroad, to a point two miles above Patton's, whence it had to be carried on men's shoulders ten miles further. In this distance, the grade for the first 2½ miles was about 800 feet per mile, and the average grade throughout was about 300 feet per mile. The transportation from the railroad to the top of the peak required 13 men for 3½ days, and one boy and two oxen for 1½ days. When we add that the total expense was $446.96, we think it will be admitted that the money was well earned.

This monument is believed to be the highest of the kind in the United States. The grave of Mrs. HELEN HUNT JACKSON, near Colorado Springs, is said to be 8500 feet above tide, but is not marked by a structure of this kind; and the AMES memorial of stone, at the highest point of the Union Pacific Railroad, with an altitude of 8247 feet, may also be ruled out of comparison, as presenting no difficulties of transportation or construction, being within a few yards of the railroad.

We must not omit, however, while we record the successful erection of the MITCHELL monument, to recall the merits and services of him in whose honor it has been raised. At the time of his death, Professor MITCHELL occupied, in the University of North Carolina, the chair of geology and mineralogy. He had been a constant contributor to *Silliman's Journal* for more than 30 years, and was a well-known authority in many departments of science.

Born in Washington, Conn., August 19th, 1793, he was, on his mother's side, a descendant of JOHN ELIOT, the "Apostle to the Indians." Graduating from Yale in 1813 (a classmate of DENISON OLMSTED, afterwards his colleague at the University of North Carolina), he taught school on Long Island and in Connecticut for three years, was a tutor at Yale College for two years, and finally, in 1818, found his life-work at the University where he labored thenceforward.

For nearly forty years his beneficent and powerful influence was felt in North Carolina, especially at the University, where, with OLMSTED, ANDREWS, CALDWELL, JAMES PHILLIPS and others, he laid the foundation for sound and liberal learning. In 1832 he assisted Professor CALDWELL in building at that institution the first astronomical observatory in the United States; and these two, assisted by Prof. JAMES PHILLIPS, determined the correct latitude and longitude of Chapel Hill, and made observations on the fixed stars.

Professor OLMSTED had started in 1819 the geological survey of North Carolina, the first in this country. Upon his removal to Yale, in 1825, Professor MITCHELL took up the work and was engaged in it until 1852, when it passed into the hands of Dr. EMMONS.

These names of the great pioneers of American science must not be permitted to die out of our grateful recollection. How they would rejoice to-day, could they behold the tardy but abundant harvest of their sowing, in the awakening of the South to science and industry; the fulfillment of their hopes and prophecies; the march of organized armies of progress along the lines of their painful and solitary surveys!

If the MITCHELL monument, looking down upon a busy and fruitful land, may symbolize the joy of these early toilers in the result of their labors, surely, on the other hand, the sons of the South will look reverently up to it, as the type of those who gave their lives to her service, in the day of lowly beginnings, but lofty faith.

## CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.

### The Lash Furnace.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In answer to your inquiry I would say that the first Lash open-hearth furnace built was No. 3, at Park Brothers & Co., Limited. The furnace was designed and the plans made for it about the last of the year of 1884. We started to build about the 1st of May, 1885, and made the first cast the 2d of September the same year. Since then the following furnaces have been built:

| | | |
|---|---|---|
| Park Brothers & Co., Limited, Pittsburg | 5 | 30-ton furnaces. |
| Carnegie, Phipps & Co., Limited, Pittsburg | 4 | 40 " " |
| Carbon Iron Company, Pittsburg | 2 | 15 " " |
| Linden Steel Company, Pittsburg | 1 | 20 " " |
| Pennsylvania Forge Company, Pittsburg | 1 | 15 " " |
| Anderson & Du Puy, Pittsburg | 1 | 15 " " |
| Makintosh, Hemphill & Co., Limited, Pittsburg | 2 | 15 " " |
| Seamless Tube Company, Findlay, O | 1 | 7 " " |
| Standard steel Casting Company, Thurlow, Pa | 1 | 20 " " |
| Total | 18 | |

Making a total of eighteen furnaces, with a daily product of 900 tons, working two heats a day.

Our furnaces here are working very nicely, as you can see by the inclosed report of some of the ½-inch round preliminary tests.

TESTS OF STEEL.

| Date of test. | Heat No. | Elastic limit. Pounds per sq. in. | Ultimate strength. Pounds per sq. in. | Elongation. Per cent. | Per cent reduction. |
|---|---|---|---|---|---|
| October 3, 1888 | 2 | 49,290 | 69,620 | 30·25 | 53·07 |
| " 12, " | 2 | 41,800 | 69,960 | 25·00 | 38·37 |
| " 3, " | 3 | 45,100 | 61,940 | 29·00 | 57·23 |
| " 4, " | 5 | 42,213 | 60,250 | 30·00 | 65·29 |
| " 4, " | 6 | 43,254 | 63,160 | 31·75 | 59·28 |
| " 4, " | 7 | 42,193 | 57,230 | 31·50 | 69·34 |
| " 4, " | 8 | 45,635 | 66,460 | 25·87 | 56·72 |
| " 4, " | 9 | 46,985 | 65,820 | 26·00 | 59·72 |
| " 10, " | 9 | 45,710 | 67,100 | 28·25 | 55·80 |
| " 4, " | 10 | 44,047 | 63,050 | 28·12 | 64·94 |
| " 4, " | 11 | 43,888 | 65,330 | 27·25 | 59·46 |
| " 10, " | 11 | 39,540 | 63,630 | 28·25 | 56·62 |
| " 4, " | 12 | 41,882 | 61,400 | 31·42 | 67·91 |
| " 4, " | 13 | 45,116 | 65,260 | 28·37 | 60·08 |
| " 5, " | 14 | 43,342 | 61,430 | 29·42 | 60·25 |
| " 5, " | 15 | 43,833 | 64,678 | 31·25 | 57·37 |
| " 10, " | 15 | 46,200 | 65,530 | 28·25 | 45·28 |
| " 5, " | 16 | 41,545 | 60,745 | 32·25 | 64·29 |
| " 12, " | 16 | 44,380 | 61,780 | 27·50 | 59·30 |
| " 5, " | 17 | 42,755 | 64,622 | 25·37 | 47·02 |
| " 5, " | 18 | 43,284 | 63,962 | 28·25 | 47·16 |
| " 5, " | 19 | 42,904 | 62,963 | 31·25 | 49·10 |
| " 5, " | 20 | 42,666 | 62,711 | 28·75 | 47·40 |
| " 5, " | 21 | 44,460 | 63,070 | 30·37 | 46·27 |
| " 5, " | 22 | 40,210 | 60,600 | 30·62 | 62·37 |
| " 8, " | 23 | 43,110 | 61,950 | 30·87 | 57·58 |
| " 8, " | 24 | 42,750 | 60,170 | 30·62 | 57·07 |
| " 8, " | 26 | 45,770 | 66,820 | 26·25 | 48·91 |
| " 8, " | 27 | 40,230 | 58,370 | 26·87 | 50·62 |
| " 8, " | 28 | 40,620 | 58,460 | 31·87 | 64·98 |
| " 8, " | 29 | 42,370 | 61,680 | 31·25 | 56·83 |
| " 8, " | 30 | 43,880 | 63,450 | 30·62 | 54·72 |
| " 8, " | 31 | 46,100 | 63,940 | 27·50 | 48·33 |
| " 8, " | 32 | 45,300 | 62,300 | 28·12 | 52·47 |
| " 8, " | 33 | 41,880 | 62,110 | 29·37 | 61·29 |
| " 8, " | 35 | 43,630 | 64,580 | 27·50 | 55·96 |

H. W. LASH, Gen. Supt.

CARBON IRON COMPANY, PITTSBURG, October.

## The Waste of Anthracite in Mining.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The subject of your editorials in the ENGINEERING AND MINING JOURNAL is one of great importance and interest to the consumers and producers of anthracite coal. This importance and interest is constantly increasing as the demand and output is growing at a rate hardly expected by any statistician ten years ago.

In August, 1880, I published an article on the "Anthracite Coal Fields and their Exhaustion. I quote from it:

"The total amount of coal still to be mined is 26,360,576,000 tons. The total waste, as experience has shown, is equal to two-thirds of the coal deposit, and reaches the appalling amount of 17,573,717,334 tons, leaving us only 8,786,858,666 tons to send to market. In all our calculations of anthracite we have counted the area as if in a level plain, and made no allowance for the undulations which must necessarily increase the amount of coal. But as many of the flexures are abrupt and broken, making much faulty and refuse coal, it will cover any over estimate of area of thickness we have made in our calculations. Our tables show that 360,017,817 tons have been sent to market in the 59 years from 1820 to 1878 inclusive. Our consumption now amounts to 20,000,000 tons annually. The increase of production for the past ten years has been 187,112,857 tons. At this rate, we shall reach our probable maximum output of 50,000,000 tons in the year 1900, and will finally exhaust the supply in 186 years."

In your estimates you have fixed the amount of coal in the ground as 9,000,000,000 tons, two thirds of which is waste, leaving 3,000,000,000 tons as the total amount of available coal to be mined, according to present system of waste, which amount would be exhausted in 75 years.

The variation of these estimates is due to the computation of the "available supply," which you place as nine billions, while we have placed it at over twenty-six billions.

Our estimates were formed as follows:

| | Area, squire miles. | Acreage. |
|---|---|---|
| First, or Southern coal-field | 146 | 93,440 |
| Second, or Middle coal-field | 126 | 80,640 |
| Third, or Northern coal-field | 198 | 126,720 |
| Total | 470 | 300,800 |

| | Yards. | Tonnage. |
|---|---|---|
| First, average total thickness of beds | 25 | 11,306,240,000 |
| Second, average total thickness of beds | 15 | 5,854,464,000 |
| Third, average total thickness of beds | 15 | 9,199,872,000 |
| Total tonnage | | 26,360,576,000 |
| Amount to be mined, onethird | | 8,786,858,666 |
| Total shipments to January 1st, 1888 | | 628,612,720 |
| Adding for local sales and amount used at mines as per Geol. Rept. (1887, est'd 6 per cent) | | 53,111,409 |
| Total production to January 1st, 1888 | | 681,732,129 |
| Present available supply workable | | 8,107,125,537 |

At present rate of production would last 202 years.
With maximum rate of production from 1890 (50,000,000 tons), would last 162 years.

If there remains but nine billions tons available coal, as you estimate, it may be divided, according to the fixed areas and acreage and relative total thicknesses of beds in the different regions:

| | Tons. | | Tons. |
|---|---|---|---|
| 1st. Southern field | 4,000,000,000 | Workable (⅓) | 1,333,000,000 |
| 2d. Middle field | 1,800,000,000 | " | 600,000,000 |
| 3d. Northern field | 3,200,000,000 | " | 1,066,000,000 |

| | | |
|---|---|---|
| First field, percentage of shipment, 30 per cent in tons | | 12,000,000 |
| Second field, " " " 18 " " " " | | 7,200,000 |
| Third field " " " 52 " " " " | | 20,800,000 |
| 100 " " " " | | 40,000,000 |

At the ratios of shipment, the Wyoming region would exhaust itself in 51 years, leaving the other regions to supply the demand with workable coal.

| | Tons. |
|---|---|
| Southern field | 721,000,000 |
| Middle field | 232,800,000 |

Assuming each field to double its proportion and ship as follows: Southern field, 65 per cent; Middle field, 35 per cent, in 16⅔ years more, or 67⅔ years hence, the Middle field would be totally exhausted, leaving the Southern field with less than 300,000,000 tons of coal to mine, that would last but 7⅓ years longer, or a total exhaustion in 75 years.

The work of the Geological Survey of the anthracite coal-fields of Pennsylvania will very likely be so far completed during the present winter, that by their investigations and compilations they will be able to more closely calculate the extent of available coal beds, and the thickness in the different portions of each region, and make an estimate based on more extensive and more exact information.

Since my publication in 1880, constant connection with anthracite mining satisfies me that the time then allowed for exhaustion of the coal was too great; nor am I satisfied that we can exceed at any time a shipment of fifty millions per annum.

My information regarding loss by pillars and waste in mining is the result of calculation and estimate in the various mines with which I have been familiar. In the Manmoth bed workings it is impossible to make any measurements of portions of pillars remaining after "robbing" has been commenced. The area must be carefully estimated and the thickness of the bed frequently taken to show the amount of workable coal and refuse. Then the total production from that portion of the mine will show the percentage of waste. This will vary according to the thickness and condition of the beds. In the smaller beds, 8 to 10 feet thick, 50 per cent of the coal has been mined, while in the Mammoth bed the results show that only 20 to 25 per cent of the amount of coal in the ground is brought to market.

### THE LOSS IN BREAKING AND PREPARING COAL.

The first experiments of much extent were made in 1869, for use as testimony in the case of Battin vs. Lehigh Coal and Navigation Company. Here "good, hard, clean Lehigh coal" was used, and not the mixture of coal and dirt as it came from the mine. It was also a test of the different styles of breakers. The result of 13 experiments showed 26 per cent of waste. Several of the tests showed the waste to be 15·71 per cent of the amount of coal. Recent experiments show but little improvement in the breaking of coal. Mr. Platt, in his book on "Coal Waste," gives loss in breaking of coal 15·5 per cent, while the loss in mining, blasting, re-handling varies from 18 to 30 per cent. The great loss, however, is in the quantity unmined and left in the ground for support. Here is really the place to look for improvement. The smaller beds can be worked by methods now in use. It is in the larger areas we must economize. When the price of coal becomes higher, more expensive methods can be adopted, and, consequently, a larger proportion of the coal secured.

I would advocate short lifts of not more than 50 or 60 yards in length and the driving of the breasts their full length, and the coal cut out, not "run" by robbing the pillars. The gangways in each lift should be driven to the limits of the leased ground and then worked towards the outlets. Wherever possible, the gangways should be driven in the small, underlying beds, and the mammoth coal attacked through inclined cross-cuts driven through the dividing rock—that is, the permanent improvements should be outside the larger beds. Where practicable, the breasts should be washed full of culm or other waste material before the pillars are mined. The large shipments of our railroad companies seem to be to secure the most tonnage possible, and lead to the working of the mines for large production more than careful mining. Those who own lands are exercising more care in mining, so as to secure a continuance of the supply. But when you have large coal beds, say from 20 to 40 feet in thickness, as in the Mahanoy district and part of the Wyoming region, how can we secure half the coal, if we must support the surface? Nothing can support the surface; no timber, nor even iron supports would answer the purpose. Any bed of coal less than 10 feet in thickness can be mined so as to secure three-fourths of the coal. In bituminous beds you can rob the pillars and let the surface fall and no harm results. The same is true in smaller anthracite beds, but when you have to mine the mammoth bed, you cannot confine the great pressure of the surface to a small area. The heavy sandstone rock which covers it when disturbed by the removal of a pillar brings on a pressure that affects the whole mine.

The Philadelphia & Reading Coal and Iron Company are doing some careful work and securing more than half their coal. The uncovering of the surface, where the cover does not exceed the thickness of the coal bed, is yielding well and gives us much economical coal. I have recently adopted a plan at the workings of Kohinoor Colliery, in the Shenandoah District, in Schuylkill County, that, I think, will enable us to secure three fourths of the coal in the mine. At this point the Mammoth bed is 40 feet thick and lies nearly horizontal. To support the surface, and the town upon it, will naturally require great pillars of coal—at least half of the mine. The plan devised and now being worked, is to bore through the superincumbent strata 400 feet thick, 8-inch holes, to the top of the coal bed.

Cast-iron troughs 10 × 12 inches wide, with continuous bands of scrapers moving in them, or what is now called a "scraper line," connect with the immense culm banks at the breaker, some 1600 feet distant. The scraper line delivers continuously a large amount of the culm at the mouth of the hole; this meets there a stream of water and a mixture of about three-fourths water and one-fourth culm, constantly drops into the mine below and there distributes itself, permeating every nook and corner of the cavities. The deposit becomes so hard as to require a pick to remove it.

It entirely fills the chamber, even to the roof, and supports the pillars, but leaving them accessible to the mine for removal when the large spaces surrounding them are entirely filled. Of course, we must direct the currents of water and culm, limiting the culm by dams or "batteries," and allow the water to flow back to the main sumpt of the mine, where it is pumped out to be again used in carrying more culm to its original abiding place. Filling with culm itself would not answer the purpose; it would form a cone of loose dirt and of no strength. But if deposited as above described, it becomes a nearly

solid mass, an abundant support to the surface or strata above the vein. The material is cheap, abundant and convenient. I can now realize, after a year's trial, that I secure three fourths of all our coal where this method has been adopted. I hope our further experience will yield even better results. P. W. SHEAFER, Engineer of Mines.

POTTSVILLE, Oct. 29, 1888.

## DISTRIBUTION OF HYDRAULIC POWER IN LONDON.

The London Hydraulic Power Company commenced operations five years ago, and now has nearly thirty miles of hydraulic mains laid in the streets. The number of consumers is constantly increasing, and it is stated that in no instance, has the use of the power once adopted been abandoned in favor of any other system of lifting machinery. Its steady progress is shown by the fact that in the month of July, 1884, the company delivered only 363,000 gallons of water per week, and the number of machines using the power was 96, while in the month of July of this year there were delivered 2,377,000 gallons per week, and the number of machines was 720.

The first and largest pumping station has been erected on a site known as Falcon Wharf, about 200 yards east of Blackfriars Bridge.

The engine house at present contains four sets of pumping engines, each being capable of exerting 200 indicated H. P. The engines are vertical compound, of a type combining the advantages of a three-throw pump with direct connection between the pump-plungers and the steam pistons. The center cylinder is high pressure, 19 inches in diameter, 24 inches stroke. The two outer cylinders are low pressure, 25 inches in diameter. The pump plungers are single-acting, five inches in diameter. The engines are fitted with surface condensers. The air-circulating and feed pumps are worked from beams connected to the high-pressure piston-rod cross-head, in accordance with the usual practice in marine engines. The floor space occupied by the engines is very small, 14 feet by 10 feet.

Each set of engines will deliver 240 gallons of water per minute into the accumulators at 750 pounds pressure per square inch, at a piston speed of 200 feet per minute. This is the normal speed of working, but they can be worked when required at 250 feet per minute, the maximum delivery being 300 gallons per minute.

The accumulators are two in number, each having a ram 20 inches in diameter and 23 feet stroke. The weight-cases are of wrought-iron and are filled with iron slag. The total weight of the case and load on each ram is approximately 106 tons, corresponding to a pressure of 750 pounds per square inch. There is capacity in the accumulator casings for increasing this load to 800 pounds per square inch. Each accumulator is fitted with an electric bell, which comes into action when the accumulators are half down, as a signal to the engineer in charge to stand by, and, if necessary start, an additional set of engines, and thus keep the supply up to the demand. The accumulators and load, weighing 250 tons, are carried by a bed of concrete supported on 12-inch piles driven well into the London clay, which is met with at a depth of about 30 feet below highwater mark.

Several ways are provided for pumping from the river. Centrifugal pumps, driven by Brotherhood's three-cylinder steam engines, were first put down in duplicate, each pump being capable of delivering 60,000 gallons per hour, but with a length of suction of 260 feet and a total head of 45 feet, the conditions were too severe to allow them to be thoroughly depended on (though they are still used occasionally), and pulsometers were added. With these it is possible to take the water at any state of the tide except at dead low water. Neither form of pump is economical in steam, but their incidental advantages, when dealing with such muddy water as that in the Thames at Blackfriar's Bridge, are considerable.

The second station has just been completed and is situated at Millbank, Westminster. It has nearly equal capacity to the first, and is necessitated by the present demand being sufficient to absorb the power available from the Blackfriars Station. The river water that is used requires filtration, but the supply at Westminster is taken from a well, which requires none.

The delivery of power-water from the Falcon Wharf pumping station is through four 6-inch mains. Two are used for the city service, and two for Southwark. The two city mains are carried across Southwark Bridge. At the junction of Holland street with Southwark street, one of the Southwark mains is continued along Stamford street and over Waterloo Bridge. Except, therefore, for 200 yards from the pumping station, the supply is carried through five 6-inch mains.

The most distant point of the main from the accumulators is at the west end of Victoria street, and is 5320 yards, or just over three miles. There is a further loss due to the valve-passages and bends in the pipes. To provide for all frictional loss in the pipes and valves, the accumulators have been loaded to 750 pounds, the stated pressure supplied being 700 pounds per square inch.

On one occasion the main valves were so set that the accumulator with the greatest load was at one end of a circuit of five miles, and the accumulator with the lighter load at the other end. The lighter accumulator was lowered and shut off, the heavier remaining at the top of its stroke. Communication was opened between the light accumulator and the main, and the accumulator was raised by the other through the five-mile circuit, the normal difference of pressure in the two accumulators being 20 feet head.

It would appear, from certain observations that have been made, that the pressure is better maintained at all parts of the system when there is a considerable demand upon the mains for power.

The mains are laid in circuit, and there are stop-valves at about every 400 yards, so that any such section of main can be isolated. The submains are usually connected to the circuit at two points with valves at each junction; then the supply to the sub-mains can be given from either six-inch main.

Where even an occasional stoppage of supply for a few hours is of great importance, two distinct service pipes can usually be given. There have been only four breaks in the mains during the last two years. There is good reason for believing that they were due either to settlement in the ground or to an excessive initial strain having been put upon the flanges in screwing up.

Two things have been demonstrated:

First—The necessity for the complete integrity of the main, and the greatest watchfulness to maintain efficiency.

Second—The possibility of laying great lengths of such mains in a perfectly sound and good condition and maintaining them so for long periods without repairs.

It is the intermittent character of the demand that makes it profitable to the consumer to pay comparatively high rates, because, though he is paying at the rate of 4d. per h. p. per hour for what he uses, he is only paying at the rate of, say 1d. per h. p. for the power he requires to have at command, and for this only during the time the machinery is at work.

Taking all the circumstances into account, it can hardly be a profitable operation to supply public power under conditions similar to those which exist in London at less than 2d. per indicated h. p. per hour. This would be from £20 to £25 per h. p. per annum, working 50 to 60 hours per week.

Any idea of supplying power from a central source at rates much below this is believed to be chimerical.

For small powers continuously working, the cost of £20 per h. p. per annum would compare very favorably with the cost of steam. At first sight it perhaps may not appear so favorable as compared with the cost of working a gas engine when at its best, where the gas engine can be used without creating a nuisance, and the gas itself is cheap. But when the oil, water, attendance, etc., required for gas engines are taken into account, the total cost of gas power is probably quite as much.

Directly, however, the gas engine is set to do intermittent work the advantage is largely on the side of hydraulic power, while for such purposes as lifting and pressing, the general convenience and simplicity of the hydraulic system are such that its use would hardly be affected, even if there were no direct economy in the cost of working.

One very important feature of this system is the assistance it is capable of rendering in case of fire. A small jet of high pressure water injected into a larger jet from the ordinary water main will give a powerful stream at the top of the highest building without the aid of fire engines. What this means has been proved in the cases of Manchester and Liverpool, in both of which cities there is a system of high pressure hydrants by gravitation. In Manchester the loss by fire is now only one seventh of what it was previous to their introduction, and in Liverpool the loss has been reduced to one fourth of what it was formerly.

The water used is measured through a meter on the exhaust pipe of each machine, so that the consumer knows how much power he uses and pays for that amount, and small customers are supplied with a minimum quantity of 3000 gallons per quarter at a charge of £1 5s. with a meter charge of 5s. The balance sheet of the company for the year 1887 showed gross receipts of £13,847, with a profit of £7254, and it is clear that the prospects of the company are considered good by the investing public, as the shares are worth about 100 per cent premium.

It is not easy to ascertain what the exact cost of the works has been, for the company does not confine its operations to London, and has commenced to carry out a similar system in Liverpool; but it seems that the total outlay on the London works, without taking into account the new pumping station at Westminster, has been £150,000; but again, we are under the impression that of this a substantial amount should be allowed for Parliamentary and preliminary expenses.

We are indebted to Mr. E. B. Ellington, M. I. C. E., for the information on this subject, and we have made several extracts from a paper recently read by that gentleman before the Institution of Civil Engineers. The works in question were designed and carried out by Mr. Ellington jointly with Mr. Corbet Woodall, M. I. C. E., and the former established the first hydraulic power works on a large scale in Hull in 1875.

## SOME FORMS OF ORE-DEPOSITS IN LIMESTONE.

Written for the Engineering and Mining Journal by Carl Henrich, M.E.

### I.

The first kind of ore-deposit which I want to call attention to, and put on record as material for a future more rational classification of ore deposits than we have at present, is a form peculiar to many of the larger galena deposits of Central Missouri. I have chosen for illustration the ore-deposit known as the "Granby Diggings," about one mile and a half southeast of Versailles, the county seat of Morgan County, Missouri. I have chosen this deposit partly on account of its being a perfect sample of its class, and partly because, from working this deposit once myself, I am intimately acquainted with all its features.

The deposit occurs nearly on the top of a ridge, near a point equidistant from the heads of three different watercourses, each one of which watercourses or creeks takes its origin in a spring, breaking out of the ground about seventy or eighty feet below the top of the ridge on which the "Granby Diggings" are located.

The ore found in this ore deposit was a pure galena crystallized in large cubes and dodecahedrons and other combinations of the regular system. The prevailing forms were large cubes, joined together frequently to flat sheets, sometimes 4 to 6 inches in thickness and several feet in length and width. Nearly all these galena bodies, varying in size from a few ounces to hundreds of pounds, were found imbedded in a red ferruginous clay, locally called "tallow clay." This clay with the imbedded galena filled the interstices between larger and smaller "boulders" of more or less decomposed magnesian limestone. The surface of these boulders was much decomposed to a crumbling dolomite sand, while the interior of the boulders was the common hard magnesian limestone of the surrounding country. The horizontal boundaries of the deposit, in which these boulders of magnesian limestone with the intervening galena bearing clay occurred, were an irregular oval, as shown on the plats of the diggings (Fig. 1), the longer axis of the deposit being about 170 feet and the smaller axis about 70 feet long. Wherever in the course of mining the boulders of magnesian limestone were cut into, and whenever any stratification planes could be observed, these stratification planes were nearly horizontal, corresponding to the stratification of the

surrounding country-rock. It was evident from this that these boulders had been very little disturbed in their original positions. The only ore adhering to the limestone was found on the walls of the ore-deposit, where frequently a more or less continuous sheet of galena was found to adhere to the wall and to follow it in depth. The walls on all sides of the deposit, wherever observed, were intact, with no crevice or seam of mineral leading into the wall.

In the direction of the larger axis of the deposit, however, to the northeast and about 300 yards distant, on the same ridge, was found another similar deposit of smaller dimensions, but of the same general character. I did some extensive mining on that side of the Granby diggings pointing to that neighboring deposit, but although we stripped that whole northeast portion of the wall clear down to the water level of a sheet of galena adhering to that portion of the wall, no sign of any crevice penetrating into the wall in that direction could be found. The interstices between the limestone boulders were widest nearest the surface, and the limestone boulders themselves more decomposed than at greater depth. Towards the water level, which was found about 50 feet below the top of the deposit, the interstices between the boulders grew smaller, and the tallow clay and the inclosed masses of galena diminished in quantity. At the bottom of the incline, however, on the southeast wall of the deposit, a sheet of galena adhering to the wall was found going down below the water level. The same was the case at the northeast side of the deposit and also at the south side opposite the Stover shaft. This shaft was sunk with the intention of intersecting this sheet of galena. But when the shaft at 85 to 95 feet depth, broke through the wall into the ore-deposit, the inrushing water drowned out the workmen, and the attempts made to lower the water by hoisting with a windlass and buckets failed to make any impression on the water level in the shaft.

In working this ore-deposit the problem presented itself to me whether to attempt following the galena below the water level in the mine. I

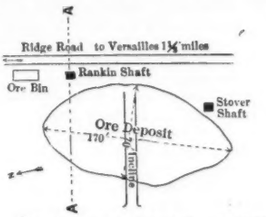


Fig. 1. PLAN OF GRANBY DIGGINGS, MORGAN CO., MO.

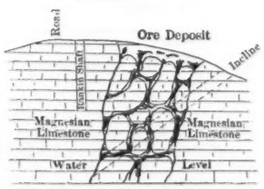


Fig. 2. SECTION A.A.

rolling limestone hills. The limestone formation here is much folded, and consists of a succession of short anticlines and synclines, the tops of the hills generally coinciding with the tops of the synclines, and the valleys or depressions between the hills with the bottom of the anticlines. As a rule the pitch of the formation is the same as the pitch of the surface, only, as a rule, the formation pitches a little steeper than the surface, owing to the subsequent abrasion of the tops of the hills and the gradual filling up of the depressions between the hills.

The ore-deposits in that limestone country are evidently old watercourses in the limestone, following some old joint plane or crevice in a layer or a series of layers in the limestone in the direction of the pitch of the strata, and working its way gradually deeper in the limestone, following first an upper layer of the limestone along its pitch for some distance, and then jumping to the next lower layer, and so on, until they seem to "pinch," at least their continuing traces have not been followed any further in the tortuous "gopher-holes," in which the district abounds, and which are here designated with the name of mines.

What characterizes these deposits more than anything else as old watercourses are the cross sections of these ore-chutes. A characteristic sample, taken from such an ore-chute of one of the best mines of the district, is represented in Fig. 4. The floor and the side walls of this trough in the limestone, filled with ore, are perfectly smooth. The roof in most cases is formed by a limestone, which is converted to a depth of several inches to sometimes a foot into a silicious iron ore, containing still a large percentage of carbonate of lime. The oxidized lead ore filling the trough contains only a few per cent of lime, but plenty of silica, much more than would be accounted for by the silica content of the limestone which once filled the space, now occupied by ore. A further characteristic of the ore found in these deposits is the large amount of chloride of lead contained in it. There is very often an empty space between the top of the ore and the roof of the deposit, as shown in Fig. 4.

In some of the mines, as in the one from which the illustrations of

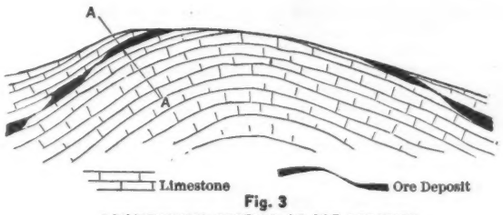


Fig. 3 LONGITUDINAL SECTION OF ORE DEPOSITS IN BEAVERHEAD CO., MONT. TY.

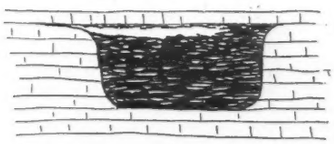

Fig. 4. TRANSVERSE SECTION A.A. Fig. 3 THROUGH ORE DEPOSIT

decided in the negative, for the reason that the most violent rains, which always sent an enormous quantity of water down into the old workings, failed to effect any appreciable rise in the water level. When this proved to be also the case after one of the heaviest rains, resembling a cloud burst and accompanying a cyclone, which passed within a quarter of a mile from the mine, I abandoned all idea of attempting to lower the water in that mine by any pump, the size of which and the running expense of which would have been in any rational relation to the size of the ore seams, going down below water level.

I afterwards, by the aid of a hand level, took the relative elevations of the three springs mentioned above, located each within a radius of about ¼ to ½ mile from the mine. I found that each of these springs was only from 10 to 20 feet below the water level in the mine, and I naturally concluded that the water level in the mine indicated the top of the water reservoir underground feeding these springs. The idea of lowering a water reservoir at least a square mile in extent did not stimulate in any way a desire to commence pumping at the mine. So the work was abandoned, and the question, whether like some of the iron-ore deposits of that region, this lead ore deposit fills only a pot hole in the limestone, or whether it is the decomposed outcrop of a deeper reaching chimney (of a standing "stock") in the limestone, remains unsolved. I am inclined, from a consideration of all the facts in the case, to believe that in this deposit we have the outcrop of what might be called a "pipe vein" deposit along a former watercourse in the limestone. I consider that the galena was originally deposited in the cracks and crevices of the watercourse in the limestone, that the "tallow" clay surrounding the galena at present resulted from the more recent decomposition of the limestone on both sides of the crevices originally filled with the limestone, leaving the galena, at least, approximately in its original place of formation.

At the Buffalo diggings in Morgan County, Mo., about nine to ten miles southwest of the Granby diggings, another such deposit of galena ore was found and has been worked out also down to the water level. There, also, on what might be termed the hanging-wall of the deposit, a sheet of galena was found to go down below the water level, and everything that has been said of the Granby diggings would be equally applicable to the Buffalo diggings, except as to the shape of the horizontal boundary and to the dimensions of the ore-deposit.

II.

An entirely different form of ore-deposit is the one observed by the writer in many of the deposits of oxidized argentiferous lead ores in Beaverhead County, Montana.

The country in which these ore-deposits occur is largely formed by

this class of deposit are taken, there is an evident connection between the ore-deposits and a large dyke of porphyry breaking through the limestone formation in the immediate neighborhood of these deposits. But other deposits of the same character are removed over a mile from any *visible* porphyry outcrop, which, of course, does not prevent the possibility of their connection at greater depths with some interbedded porphyry sheet or with a porphyry dyke, which does not reach to the surface of the ground. I am, however, not asserting the necessity of any such connection.

## COST OF IRON MAKING IN TROY.

During the course of the Burden trial at Troy, John H. Allen, expert accountant, testified as follows:

The books of the Burden Iron Company showed that in April, 1886, the quantity of Hudson River ore used in the mixture at the Burden works was 25 per cent. After that it was increased, until in January, 1887, it was 50 per cent, and it had remained at 50 per cent ever since, down to September, 1888. The quantity of this ore received in 1885 by the Burden Iron Company was 56,080 tons, in 1886 it was 10,475 tons, and in 1887 it was 11,661 tons. The cost in 1885 was $3.11 7/10 per ton, and in 1886 it was $3.13 9/10. These figures show the cost of the ore laid down at the works. The average of pure metallic iron in the ore, as shown by the company's analysis book, was 45·54 per cent in 1884, 43·26 per cent in 1885, and 43·98 per cent in 1886. The average cost of pig iron made by the Burden Iron Company in 1883 was $21.43. The output was 15,798¼ tons. In 1884 the cost of pig iron made by the company was $18.33 per ton, and the output was 23,583¼ tons; in 1885 the cost was $17.38 a ton, and the output was 13,578 tons; in 1886 the cost was $18.96½ a ton, and the output was 15,197 tons; in 1887 the cost was $19.17½ a ton, and the output was 9132 tons. January 1st, 1885, there were 5496 tons of pig iron on hand, according to the inventory, and it was rated at $17.50 a ton. January 1st, 1886, there were 8571 tons on hand, inventoried at $16 a ton. January 1st, 1887, the inventory showed 7064 tons on hand, and the value was fixed at $16.50 a ton, and January 1st, 1888, there were 6668 tons inventoried at $17 a ton. The cost of making iron at the Burden works this year was stated as follows: January, $18.20; February, $19; March, $18.94; April, $17.53; May, $20.61; June, $24.01; July, $23.36; August, $19.13; September, $17.09. Other figures were given showing the cost of pig-iron other than that of the Hudson River Company, with the intent to establish the allegation that as good a grade of ore could be laid down at the Burden works at a less figure than was paid the Hudson River Company.

## STEEL RAILS AND SPECIFICATIONS FOR THEIR MANUFACTURE.*

By Robert W. Hunt.

(*Concluded from page 350.*)

### HUNT'S SPECIFICATIONS FOR BESSEMER STEEL RAILS.

*Section.*

SECTION 1. The section of the rail rolled shall conform to the template furnished by the railroad company with an allowance in height of $\frac{1}{64}$ of an inch under and $\frac{1}{32}$ of an inch over, being permitted in a delivery of 10,000 tons of rails. The fit of the fishing or "male" template shall be maintaned perfect.

SEC. 2. The weight of the rail shall be kept as near to —— pounds per yard as is practical after complying with Section 1.

*Lengths.*

SEC. 3. The standard length of rail shall be 30 feet at a temperature of 60 degrees Fahrenheit. Shorter rails of —— lengths will be accepted to the extent of 10 per cent of the entire order. A variation in lengths of one fourth of an inch longer or shorter than the above specified lengths will be allowed.

*Finish.*

SEC. 4. The rails must be free from all mechanical defects and flaws, and shall be sawed square at the ends, and the burrs made by the saws carefully chipped and filed off, particularly under the head and on top of the flange. In sawing, care must be taken to avoid a flow of steel which will produce a swell on the top of lower flange, as the rail lies under the saw, thereby affecting the fit of the fish-plate.

SEC. 5. The rails shall be smooth on the heads, straight in all directions, both surface and line, and without any twist, waves or kinks, particular attention being given to having the ends without kinks or drop. The hot straightening shall be carefully done, so that gagging under the cold press will be reduced to the minimum, and so applied that the rails shall not be made "lumpy."

*Drilling.*

SEC. 6. Circular holes —— inch in diameter shall be drilled through the web at —— inches from the bottom of the flange. The center of the first hole —— inches from the end of the rail, and —— inches from the center of the first to the center of the second hole, and so on if more than two holes are required. These holes must be accurate in drilling in every respect and left without burrs.

*Branding.*

SEC. 7. The number of the charge, the name of the maker, the month and year of manufacture, shall be marked in plain letters and figures on the side of the web of the rail in such a position as not to be covered by the fish-plates when laid in the track. If the purchaser prefers, the number of the charge shall be stamped on the end of the rail.

*Percentage of Carbon.*

SEC. 8. The steel to contain as high a percentage of carbon as the maker is willing to put in and still meet the requirements of sections 9 and 21.

*Tests.*

SEC. 9. While the heat is being cast, two (2) test ingots shall be made. The first from steel going into the first regular ingot; the other from metal representing the last one. These test ingots shall be 3 × 3 inches, and not less than 4 inches long. From them bars at least $\frac{1}{2}$ inch square shall be drawn at one heat by hammering. Each bar when cold shall be bent, without breaking, by the blows of a sledge to not less than a right angle. Should one bar from a heat fail and the other stand the test, a third bar may be taken from a bloom rolled from the same ingot represented by the failed bar. If this stands the test it shall be accepted in lieu of the failed one. If the makers choose more than the two test ingots may be taken, but they must be from the steel of the first and last regular ingots. If this is done and a test bar fail another one may be drawn from the duplicate ingot and tested, and, if it stands, accepted.

*Treatment of Ingots, etc.*

SEC. 10. After the ingots are cast, they shall be either constantly kept in an upright position until ready to be rolled, or else so maintained until the interior steel has had time to solidify.

SEC. 11. No "bled" ingots, or ingots from "chilled" heats shall be used in the manufacture of rails under this contract.

SEC. 12. No ingots from badly teemed heats shall be used, excepting as they shall be subject to the provisions of Sec. 16.

*Cutting of Blooms.*

SEC. 13. After cutting off, or allowing for the "sand" or top end of each ingot, at least 12 inches more of seemingly solid steel shall be cut off that end of the bloom or partially formed rail; if the latter, then the pieces so cut off shall equal 12 inches in length of a 7-inch by 7-inch bloom—a greater length than 12 inches being preferred; and if after cutting such length the steel does not look solid, the cutting shall continue until it does.

*Heating.*

SEC. 14. Care shall be taken to avoid over-heating the steel, in shape of either ingots or blooms, and under no circumstances shall a "cinder" heat be allowed. That is a heat high enough to cause the cinder to run off the steel as it is being drawn from the furnace. This does not apply to cinder which may be sticking to the under side of the steel when drawn from a horizontal furnace, or to the bottom of an ingot when drawn from a soaking pit.

*Inspection.*

SEC. 15. Inspectors representing the purchaser shall have free entry to the works of the makers at all times while this contract is being filled; and shall have all reasonable facilities afforded to satisfy them that the rails are being made in accordance with these specifications. The makers shall furnish them with the carbon determinations of each heat, if so required.

SEC. 16. The inspectors shall have power to reject rails made from insufficiently sheared blooms; or from heats, the test pieces of which have failed; or from badly poured heats, or from "chilled" heats, or from "bled" ingots. The rails made from uncut blooms, if otherwise perfect, to be afterwards received as No. 1 short rails, if sufficient lengths have been sawed off to make an amount of steel equal to the original demand of twelve inches. The rails made from heats, the test pieces of which have failed, may be accepted as No. 2 rails. The rails from a badly poured heat may be received as No. 2 rails; but if made from a "chilled" heat or "bled" ingot, to be absolutely rejected. By an imperfectly poured heat is meant one which from any cause has been teemed without the control of the operator. A "chilled" heat is one which, from the steel chilling, has to be either pricked, or poured over the top of the ladle. A "bled" ingot is one from the center of which the liquid steel has been permitted to escape.

SEC. 17. Imperfectly drilled, straightened, or chipped or filed rails shall be rejected, but will be accepted after being properly finished.

SEC. 18. Rails failing to comply with Sec. 1 will be rejected as No. 1 rails.

*No. 2 Rails.*

SEC. 19. The requirements of No. 2 rails shall be the same as for the No. 1, excepting they will be accepted with a flaw in the head not exceeding $\frac{1}{4}$ of an inch, and flaws in the flanges not exceeding $\frac{1}{4}$ inch in depth, and may have been made from an imperfectly poured ingot, or heats from which the test bars have failed.

SEC. 20. No. 2 rails to the extent of —— per cent of the whole order will be received.

*Guarantee.*

SEC. 21. The rail makers to guarantee the No. 1 rails against breakage and unusual wear at the ends or elsewhere for five years from the time of delivery to the railroad company. And should any such rails so fail, will, upon the return of such failed rails to their works, deliver free of cost on cars at their works perfect rails to replace such failed rails, the failure of which is not attributable to improper laying, or want of care after being laid, or unusual circumstances of derailment from failure of other railway machinery or appliances, or negligence of the railroad company's employés. In event of failure at the ends or elsewhere of the No. 1 rails, not exceeding 10 per cent of the amount of the contract, before the expiration of the five years' guarantee (and when the rails in all other respects warrant such a course), the railroad company will cause to be cut off so much of such rails as may be necessary to make perfect rails of them, but in no case leaving them less than —— feet in length. The maker to pay in cash for cutting, redrilling and restraightening such rails. The loss in weight so sustained by the railroad company to be made up to them by the makers on the return to them of the pieces so cut off in good and perfect full length rails of such section as may be agreed upon. The points of delivery of failed rails, ends of rails cut off, and rails to replace the same, or mode of such settlement, may be varied to conform to the peculiarities of each contract.

*A paper read at the meeting of the American Institute of Mining Engineers, October, 1888.

## CONCENTRATING PLANT OF THE CHATEAUGAY ORE AND IRON COMPANY

In our issue of June 9th we described and illustrated the Conkling jig, in use at the Chateaugay Ore and Iron Company's works, Lyon Mountain, N. Y., and we now supplement the information then given by the following description of the new concentrating works from a paper by Mr. Theodore A. Blake.*

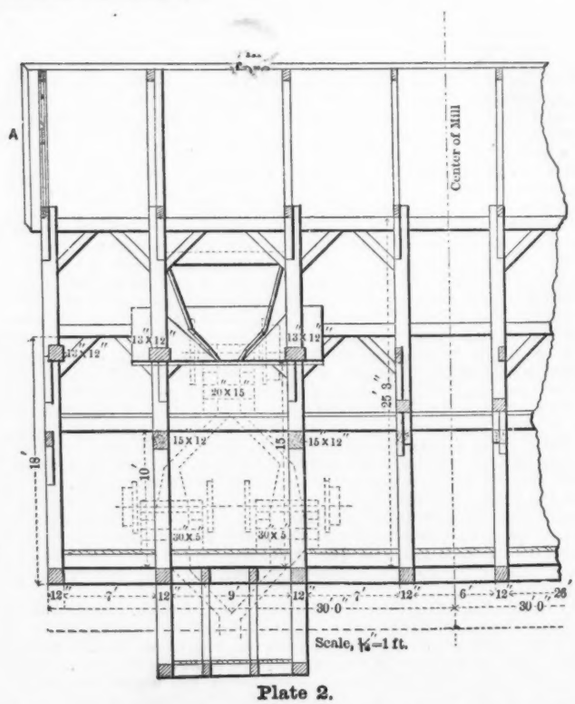


**Plate 2.**

This is a complete crushing and concentrating plant, with a daily capacity of 600 long tons, the crushing being done entirely by Blake crushers, and from fifteen inches down to $\frac{1}{4}$ of an inch. It was built in accordance with plans shown in Plates 1 and 2. The deposit or vein of magnetic

* Paper by Mr. Theodore A. Blake upon "The Blake System of Fine Crushing. Vol. XVII. Transactions of the American Institute of Mining Engineers.

iron ore is enormous, and the output from this mine often exceeds 1500 tons daily. The richer portions are sorted out and shipped; the leaner ones, consisting of magnetic iron ore in grains, disseminated through a tough quartzose and feldspathic gangue, are sent to the mills for concentration. In order to effect this by jigging, with best results, it must be reduced to a size to pass a ¼-inch or $\frac{5}{16}$-inch round hole. The jigs used are those known as the Conkling, with an annular revolving sieve and central discharge. The concentrates pass into a hutch from whence they are taken out by belt elevators. The capacity of one of the jigs, as run at Chateaugay, is 100 tons of crude ore in twenty hours, or 5 tons per hour. The elevation and plans of this mill, in accompanying Plates 1 and 2, show clearly its construction. The ore is brought to the mill by rail, inside dumping cars, carrying on the average seven and a half to eight long tons each, from the various dumps one quarter to one half of a mile distant. The mill consists of two groups or systems of crushers, with elevating and screening appliances, each group being an exact duplicate of the other; a "jack pulley" on main line shafting being placed centrally between them. Power is derived from a 250 horse-power Harris-Corliss engine, and a battery of three 100 horse-power boilers.

Each group consists of the following crushers, all of the Challenge pattern, one 20 × 15, crushing from 15 inches to 2 or 2½ inches. Product of each 20 × 15 is divided, going to two 30× 5 crushers.

Product of 30 × 5s is elevated and screened; that passing a ½-inch round hole is finished product as far as crushing is concerned, and is carried to the jigs. The "coarse," 1½ to ½ inch, goes to three 60 × 2 multiple crushers, each with three jaw openings 20 × 2 inches. Product of these is elevated in No. 2 elevator and screened, formerly through holes ¼ of an inch in diameter, now through $\frac{5}{16}$ holes. That passing through the $\frac{5}{16}$ screen holes goes to jigs; that going through $\frac{11}{16}$ holes goes to two 15 × ½ fine crushers. Each of the 15 × ½ crushers has seven jaws, with openings each 15 × ¼ inch. Material not passing $\frac{11}{16}$-inch holes, but going out the end of screen, goes back to the 60 × 2 multiple crushers. Product of 15 × ½ fine crushers is elevated and screened, material not passing through $\frac{5}{16}$ holes returning to them. Each group of crushers has three Conkling jigs.

**The Memphis, Tenn., Bridge.**—Work on the great bridge which is to span the Mississippi River at Memphis, Tenn., has been commenced. The bridge proper is on the cantilever plan, and will consist of a channel span 770 feet in length. This is said to be the longest single span of the kind in the world, and its construction is a difficult piece of engineering. The bridge will also have two spans each 620 feet in length. The bridge will be thirty-four feet in width, and while only one railroad track will be used at present, the strength of the bridge will be such that two tracks can be laid. The plans already contemplate a wagon road for vehicles. The bridge will be approached from the west over an iron trestle 5200 feet in length and an embankment of 1800 feet in length. It will be approached from the east over an iron trestle 1000 feet long and over an embankment. The bridge will be seventy-five feet above high-water mark. The estimated cost is $2,200,000.

## A COPPER SYNDICATE CONTRACT.

We reproduce below one of the contracts between the French copper syndicate and the Atlantic mining companies of Lake Superior:

"Agreement made this 19th day of April, in the year 1888, by and between the Atlantic Mining Company, of New York, a corporation organized and existing under the laws of the State of Michigan, hereinafter called the sellers, and La Société Industrielle Commerciale des Métaux de Paris, hereinafter called the buyers, witnesseth: The parties hereto having, in consideration of the sum of $1 to each of them in hand paid by the other at or before the ensealing and delivery of these presents, the receipt whereof is hereby acknowledged, and for other good and valuable considerations to them thereunto moving, mutually agreed together as follows:

1. The sellers herein agree to sell, and hereby do sell, to the buyers the entire copper output of their mines for about three years, commencing May 1st, 1888, and ending December 31st, 1890, estimated at 4,500,000 pounds of refined copper for each of the three years, and at all events not to exceed this amount per year, deliveries by sellers during 1888 not to exceed two-thirds of the above stipulated amount.

2. The price of such copper to be 13 cents per pound cash on delivery in New York, and in addition such sum as shall be equal to one-half the net profits realized above this price on resales thereafter made of said copper as hereinafter provided.

3. The copper is to be made by the sellers and delivered to the buyers in any shape or shapes or sizes ever made by the Detroit & Lake Superior Copper Company, which the buyers may desire and designate according to schedules to be furnished to the sellers by the buyers through Jere Abbott & Co., of New York, provided such sizes can be made of the company's mineral by the smelting works, but in the absence of schedules the copper is to be put into ingots.

4. The copper shall be delivered by the sellers in New York City free on board ship or at warehouse for storage, as the buyers may direct.

5. Under the sole direction and control of the buyers, the sellers, when so requested, will act for them without charge or commission in selling, invoicing and collecting payments for any of this copper which the buyers desire to be resold in the United States, and such copper may be forwarded directly from the smelting works to any required point, the delivery of same at New York, as provided in article fourth, being waived by the buyers.

6. Payments to the sellers by the buyers hereunder shall be made cash on delivery or on tender of the shipping or storage documents—namely, bill of lading or warehouse receipt and Detroit and Lake Superior Mining Company's certificate of weight.

7. The copper shall be produced and delivered, as nearly as possible, in equal monthly quantities.

8. The sellers are not to be held responsible for failure to deliver at any time caused by strikes of workmen in their own employ or in the employ of others, accidents at the mines or works, lack or interruption of transportation or any other causes beyond their control.

9. It is also understood that the estimate of production herein stated is greater than the average annual production of the sellers' mines, and,

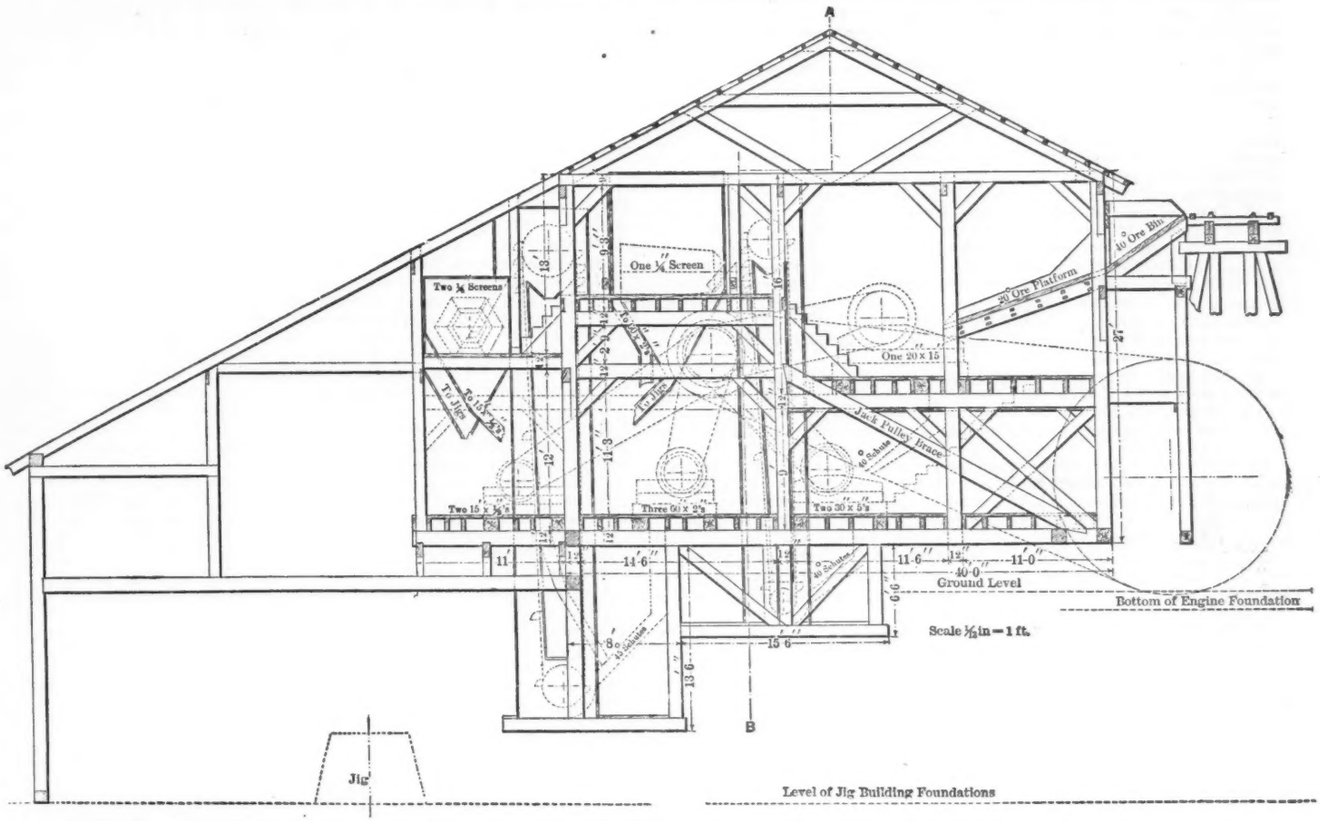


PLATE I.—CONCENTRATING PLANT OF THE CHATEAUGAY ORE AND IRON COMPANY, NEW YORK.

on this account, the sellers are not to be held liable for failure to deliver the full quantity herein mentioned, provided there shall be any failure of production of the mines.

10. Any deficiency of production in any one year is not to be added to the production of the following year; but this applies only to deficiency of production and not to delay in transportation.

11. Upon the execution and delivery of this contract, the buyers agree to deliver to the sellers a letter of credit of satisfactory bankers for amount of all purchases under this contract, down to May 1st, 1889, which letter of credit shall provide for payment by the bankers, on tender or delivery to the bankers of the documents above specified; such letter of credit to be availed of by the sellers for such portion of the copper as is not resold through them in the United States; and at least 30 days before May 1st, 1889, the buyers shall furnish to the sellers an additional letter of credit, which shall be similar in form and substance and cover all purchases made and delivered hereunto until May 1st, 1890, and at least 30 days before May 1st, 1890, the buyers shall furnish to the sellers an additional and similar letter of credit covering the balance of all purchases and deliveries made under the said contract; it being understood and agreed that the sellers will not draw on or against any of the credits so given except after demand of payment on the buyers or their agents and default therein. It is further understood that in no one month shall the said credit be drawn against for an amount greater than the contract price of the proportionate delivery of copper for such month under this contract.

12. The sellers agree to guarantee all the sales that shall be made by them hereunder for the buyers, such guarantee to extend only to a guarantee of the cost price to the buyers of said copper under this contract, but no further, it being the intention hereof that to the extent which the sellers resell the said copper for the buyers, they shall release the said buyers from any further obligation to account to them therefor; but the said sellers, in case of loss by any such sales, shall not be bound to compensate the said buyers for any loss of profit arising to them thereby.

13. The sellers, in addition to the price of 13 cents per pound, herein agreed to be paid by the buyers for copper delivered hereunder, shall be entitled to receive from the buyers one half of the net profits that shall accrue by reason of resales of the said copper either by the sellers, as agent for the buyers, or by the buyers, either in the United States or elsewhere, after deducting storage, ocean freight, insurance, charge for interest at the rate of 6 per cent, and all other charges, including brokerages, but no commission shall be charged by either party for effecting such resales.

14. The said sellers shall render monthly accounts of all productions of their mines and of all resales made by them hereunder as the agents of the buyers, and the buyers shall also account for all resales made by them, and settlements of profits arising from resales by either party shall be made quarterly.

15. Messrs. Jere Abbott & Co., of New York City, are hereby nominated as agents for the buyers to receive for them notice of shipments and demand of payment, and to give direction as to the delivery, and to receive tenders, and to direct as to resales, and to receive shares of profits arising by said resales, and generally to act for the said buyers in all matters in connection with this agreement; and on the failure of the said Jere Abbott & Co. to act as such agents, the bankers named in said letters of credit shall be considered and hereby are acknowledged as agents of the buyer for those purposes.

16 It is further mutually agreed between the buyers and the sellers that all matters of differences arising with reference to the obligations of this contract or the interpretation thereof shall be submitted to three arbitrators resident within the United States, one of whom shall be appointed by the buyers, another of whom shall be appointed by the sellers, and a third of whom shall be selected by the two arbitrators thus appointed, and that the said arbitrators shall promptly hear, and a majority of them determine, all such questions of difference, and make their award in writing, which award shall be binding upon the parties hereto.

In witness whereof the said Atlantic Mining Company, of ———, has caused these presents to be sealed with its corporate seal, and the same to be subscribed in duplicate by its treasurer, and the Société Industrielle et Commerciale des Métaux de Paris has.

ATLANTIC MINING COMPANY.

By JOHN STANTON, Treasurer.

SOCIETE INDUSTRIELLE ET COMMERCIALE DES METAUX.

E. SECRETAN, Administrateur-Directeur.

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**Electric Lighting of Stages in London.**—Electricity is being applied with some success to the lighting of omnibuses in London. The accumulators are placed in a small box beneath the body of the vehicle. The lamp stands in a frame, and is so arranged that, by being moved a little towards right or left it is lighted or extinguished. The frame is connected with the accumulator by a small hidden wire. One charge of the battery is sufficient for two days. The invention is in practical use on some of the London omnibus lines, and is said to work excellently.

**The First Railway in China.**—The first annual report of the first railway in China has been issued by the directors. The line runs from Tongsan to Yungchong, in the province of Chihli, in North China. Its length is 90 li, or about 27 miles, and it owes its existence to the Kaiping coal mines, from which a considerable portion of its revenue is derived. The gross receipts were 53,943 taels (about £13 000), and the net profits 19,606 taels (£4,900). A dividend of 6 per cent has been declared on the paid-up capital of 250,000 taels, the nominal capital being 1,000,000 taels or £250,000. The principal items of the goods traffic were 170,588 tons of coal, 81,543 tons of bricks, 15,566 packages of general merchandise, and 4,000,000 pounds of lime.

**Largest Pontoon Bridge in the World.**—The pontoon bridge over the Missouri River at Nebraska City is said to be the longest in the world. Its length across the navigable channel is 1074 feet, while the back channel is traversed by a causeway 1050 feet long, supported on cribs. The charter for this bridge has been held for twelve years, because of the difficulty of obtaining financial support for a project which appeared so impracticable. It is stated that the entire bridge was built in twenty-eight days, at a cost not exceeding $18,000, by Col. S. N. Stewart, of Philadelphia, assisted by Gen. Lyman Banks, of Iowa. The draw is V-shaped, with the apex down stream. It is operated by the current, and controlled by one man. The clear span is 528 feet. The bridge was completed in August, and is doing good service. It will be removed during the ice season.

**The Electric Shell.**—Experiments, carried out with great secrecy, but reported to have given very satisfactory results, are being made at Kiel with the new electric shell, thrown from Zalinski's pneumatic gun. This shell, which is of gun metal, ⅛ inch thick, and made in one piece, is 6 feet 8 inches long, and weighs about 220 pounds. It carries a charge of 600 pounds of blasting gelatine. This formidable missile is constructed to explode either from the shock of striking against a resisting body, or from the heating effects of an electric current after two seconds of immersion in the water. The shell contains the elements of a chloride of silver battery to which the necessary water is admitted on the shell sinking. Thus, if the shell strikes the ship but lightly, or drop a little short of its mark, it will explode beneath the surface of the water two seconds later. It is expected to be useful in blowing up an enemy's fixed torpedoes.

**A Large Flume.**—A flume 35¼ miles long was commenced near San Diego, Cal., in June, 1887, and is now nearly completed. The box is built entirely of 2-inch clear selected redwood without knots or sap. About 200 men have been constantly engaged, and 9,000,000 feet of lumber, B. M., have been used. There are 315 trestles, the longest of which, Los Cochos, is 1700 feet long and 85 feet high. Its construction required 250,000 B. M. feet of lumber. The Sweetwater trestle is 1200 feet long and 85 feet high. The main timbers used in these trestles are 10 × 10 and 8 × 8. They were put together on the ground and raised to their position by horse-power. There are 8 tunnels, the longest of which is 2100 feet long. The tunnels are 6 × 6 feet, with arched roof. The flume has a uniform grade of 4 7 feet per mile. Much of the lumber had to be drawn 700 and 800 feet up the sides of steep and rocky mountains. The lumber was loaded on cars running on a portable track and attached to a heavy wire cable. The motive power was furnished by a portable cable engine.

**Important Land Office Decision.**—The Secretary of the Interior has just rendered a decision of some importance in the matter of placer mining. Rosina T. Gerhauser, as transferee of the southeast quarter lot 3, section 24, T 10, range 8, Helena land district, from Adam Gerhauser and Philo Rice, applied to purchase the claim. The local office denied her application on the ground that she had not complied with the statute and regulations by having the claim surveyed by the United States Deputy Surveyor. Claimant appealed to the Commissioner of the General Land Office, who affirmed the decision of the local officer. The Secretary, on the 26th ult., decided the case by overruling the Commissioner. In the course of his decision he says: "Section 2,337 requires an applicant for a placer claim which cannot be conformed to legal subdivisions to make a survey and plat of the same, but the same section expressly excepts from such requirements the applicant for a placer claim which does so conform. The record shows this claim to be in conformity with a legal subdivision; it is evident that the government survey is the legal source of information concerning it." To hold that it must be surveyed would be to deny the statute which declares it unnecessary.

**A Mint for China.**—The British Consul at Canton, in his last report, refers to the proposed institution in that city of a mint on an extensive scale for the coinage of copper "cash," and possibly of dollars, the plant for which has been procured from England. It is hoped that there will be a return to the good copper coinage of the early emperors of the present dynasty; but as the relative value of silver and copper has latterly approached far more closely than heretofore, it is difficult to see how coin of the orthodox standard weight can be minted at the government rate of 1000 cash to a tael, and the temptation will be great to buy up the coins and melt them. A silver coinage is also part of the scheme, but the consul thinks if this be attempted the mint will be a failure. Foreigners and Chinese alike will look on the new coins with suspicion, and it will be difficult, if not impossible, to get them into circulation. What is needed, says Mr. Alabaster, is a government tael coinage, and if taels with coins representing the fraction thereof were minted, receivable all over China in payment of taxes, duties, etc., and protected from defacement by stringent regulations, they would find speedy favor, as they would be a great convenience, and they might in time displace the dollar; but a new dollar coinage is not needed. Mexico and Japan amply supply the necessities of trade, and a new coin would be certain to be at a discount, even if exactly of the same weight and fineness as those already in circulation, and if of different weight would be a source of complication.

**Earnings and Expenses of Japanese Coal Miners.**—The principal coal mines in Japan are situated on the Island of Takashima, outside the harbor of Nagasaki. They form one of the principal centers of coal supply in the East, and have now been worked by a lessee of the Government with all the more recent and improved appliances for about sixteen years past. According to a recent official report, 2500 miners are engaged, the total population of the island being 10,000. The remainder is composed of fishermen, officers, mechanics, surface laborers, and a floating population of hangers-on to the miners. The latter have daily rations sold at fixed prices; these consist of rice, vegetables, pickles, tea, fish, beef soup, and occasionally beef, the total daily cost being under 5d. The daily earnings are 11¼d. to 12½d., and the total reductions for necessary expenses are altogether 7¼d., leaving between 4d. and 5d. clear, while the scale of dietary is far above the average of the same class elsewhere in Japan. Married and unmarried men live apart. The latter live in buildings containing living-rooms, dormitories and eating rooms. The kitchens and offices are all apart from the dwellings, with special drainage into main conduits. The rooms are warmed by large fire-places, and ventilated and lighted by windows fitted with sliding Venetian shutters. The area allotted to each man in the living-rooms is about 500 cubic feet of air space. The married people live in separate apartments giving about 2000 cubic feet of air space. From July to October the island is put into a state of semi-quarantine against all outside communication, partly with a view to prevent the importation of epidemics, but also to prevent the sale of delete-

rious foods brought from the mainland. All such food as seaweed, unripe fruit, uncooked vegetables, shell-fish, etc., are strictly forbidden, as is also the drinking to excess of intoxicating liquors.—*London Times.*

**Compulsory Insurance for Workmen and Miners in Germany.**—The following extract from an article by Mr. Geo. G. André in a recent number of the *Colliery Guardian*, is interesting as showing the working of the new labor laws in Germany:

German colliery owners are beginning to feel the burdensome effects of the new laws to which they have been subjected. These laws have for their object the amelioration of the condition of the workingmen, and consist in several enactments giving to the men compensation for injury, or providing an insurance fund for cases of accident and illness. Besides these, fresh regulations have been imposed on owners and managers with a view to diminish the risk of accident. All this is good, and is to be regarded as "progress." But it has an influence on trade in a direction apt to be overlooked. It tends to increase the cost of production, and in these times of keen competition a slight increase in the cost of production may make all the difference between commercial success and commercial failure. It has been stated on good authority that the cost of getting coal has been argumented by these laws fully 6 per cent all round. The advantage which the German workman derives from the relief and pension funds contributed to in equal proportions by masters and men, and established at every important works, are shown by the annual report of the Union Ironworks Company at Dortmund. This company employs in its ironworks and collieries, 6500 hands. The available capital in these funds at the end of the financial year amounted to £60,790. The contribution on the part of the company in the year was £3557. The payments from the funds in the year were £3067 for cases of sickness; £2302 for members permanently invalided; £2018 for pensions to widows and maintenance for orphan children. The colliers had beside these a special fund to draw upon.

**The Pressure Required to Solidify Powdered Metals.**—In his Cantor lectures, delivered last March, Professor Chandler Roberts Austen dealt with the formation of solid metals by compressing strongly the powders of the constituent metals. Since 1878, the labors of Professor Walthère Spring, of the University of Liège, have been mainly devoted to the study of the effect of compression on various bodies. The particles of a metallic powder left to itself at the ordinary atmospheric pressure will not unite, but by augmenting the points of contact in a powder, the result may be very different. Professor Austen's experiments were made with the aid of a compression apparatus, in which the metallic powder is placed under a short cylinder of steel, in a cavity in a steel block divided vertically, held together by a collar. The pressure is applied to a cylindrical rod. Under a pressure of 2600 atmospheres on the piston, or 13 tons on the square inch, lead, in the form of filings, becomes compressed into a solid block, in which it is impossible to detect the slightest vestige of the original grains; while, under a pressure of 5000 atmospheres, lead no longer resists the pressure, but flows as if it were liquid through all the cracks of the apparatus, and the piston of the compressor descends to the base of the cylindrical hole, driving the lead before it. The more interesting results were obtained by Spring with crystalline metals. Bismuth, as is well known, is crystalline and brittle, yet fine powder and bismuth unites under a pressure of 6000 atmospheres into a block very similar to that obtained by fusion, having a crystalline fracture. Tin, when compressed in powder, unites, and if it is made to flow through a hole in the base of the compression apparatus, the wire so formed sometimes, though not always, emits the peculiar "cry" of tin when bent. The following figures show the amount of pressure required to unite the powders of the respective metals: Lead unites at 13 tons per square inch tin at 19 tons, zinc at 38 tons, antimony at 38 tons, aluminium at 38 tons, bismuth at 38 tons, and copper at 33 tons. Lead flows at 33 tons per square inch, tin at 47 tons.

**Discovery of Remains of Gigantic Extinct Animals in Australia.**—The Sydney *Morning Herald* states that Mr. C. S. Wilkinson, Government geologist, has forwarded to the Minister for Mines a report from Mr. William Anderson, geological surveyor, relative to a most interesting deposit of bones from the Myall Creek, near Bengera, the new diamond field in New South Wales. The bones occurred at a depth of about fifteen feet from the surface, in a bed of greenish tenacious clay overlaid by a black carbonaceous layer, topped by a considerable thickness of stiff, greenish clay, which the surface till rests. This series of clay beds rests on the tertiary basalt, so that the age of the deposit is evidently post-tertiary. The bones are very brittle, and more or less fragmentary. The specimens recovered, which amount to about four tons in weight, form the largest collection yet obtained from any one deposit in Australia. They consist chiefly of limb bones, vertebræ and jaws, some of the latter in very perfect condition. The largest is a lower jaw of *Diprotodon*, which measures 2 feet 8 inches from the point of the tusk round the angle of the jaw to the articulation of the upper jaw, while one molar tooth has a circumference of 8 inches. Many of the vertebræ measure 5 to 7 inches in transverse diameter. Large numbers of the vertebræ and jaws of smaller animals occur, and a few fragments of the jaws and isolated teeth of *Thylacoleo carnifex* (Owen), a large carnivorous marsupial, met with but rarely. Birds' bones are not numerous. A large number of the fragments, particularly of the long bones, present evidence of having been gnawed, but Mr. Anderson is not in a position to say the teeth-marks are those of *Thylacoleo*. He adds that he found no evidences of the presence of human weapons or implements, but that, besides their palæontological value, the investigation of such ossiferous deposits is of the greatest scientific interest and importance in relation to the question of the antiquity of man in Australia, and to determine whether or not man was contemporaneous with these gigantic extinct animals, and whether, as Professor Owen has suggested, their extinction was largely due to the advent of man upon the Australian continent.

**Mining Statistics from Freiberg and Altenberg.**—The following interesting details are from the statistics of the Imperial station at Freiberg. In the year 1887 there existed at Freiberg 65 mining works and structures, comprising 17 belonging to the state, 8 district, 17 to mining companies and 23 to single proprietors, etc. Of the 17 mining companies 2 gave dividends (Alte Huffnung Gottes in Kleinvoigtsberg, 600 mks. per share = 76,800 mks.; Gesegnete Bergmanns Hoffnung Fundgrube, 525 mks. per share = 67,200 mks.), the remaining 15 exacted subsidies. The reports of the 23 establishments of single proprietors and small companies were comparatively the same. Including a surplus of 55,834 mks. paid off by the Rothschönburg stulm to the Staats-Kasse, the divided profits amounted together to 199,834 mks. The total products were as follows: Silver, 32,069 kg. (1886, 34,431 kg.); lead, 3,102,160 kg. (1886, 3,543,073 kg.); other metals, as copper, nickel, cobalt, zinc, arsenic, sulphur, 3,909,153 kg. (1886, 4,623, 266 kg.) for which 3,870,272 mks. were paid, including proceeds from heavy spar, ore specimens, etc. (amount in 1886, 4,258,453 mks.). The results, therefore, compared with previous year, show a falling back of 388,181 mks. The total number of workmen and miners at the close of the year 1887 were 5987, to which should be added 121 men engaged by the day. In the Altenberger Revier, were in working 6 silver mines with 25 hands, 5 tin mines with 354 hands and 2 iron-stone mines with 77 men. The non-working mines amounted to 17. Of the mines in working in 1887, 3 tin and 1 iron stone mines covered their costs for the year, whilst the rest required subsidies, which amounted in the tin mine companies to 96 mks., in the iron-stone mines to 508 mks., and in the silver mines to 9658 mks., making a total of 10,263 mks. The products of the silver mines reached only 73 kg. silver, of a value of 8664 mks., including profits of smelting house; the tin mines produced 64,902 kg. tin in value of 163,357 mks. (1886, 166,722 mks.); 39,719 kg. wolfram ore in value of 19,140 mks. (1886, 20,380 mks.); 518 kg. bismuth, value 8415 mks. (1886, 9040 mks.), and other products, value 3341 mks. (1886, 4503 mks.). In spite of the satisfactory average price for tin (110·10 mks. against 107·50 mks. per centner in previous year), the productions of the Altenburger Zwitterstocks company, having been influenced the whole year by the constantly occurring want of motive power, cannot be said to be very favorable. The production was incessantly failing, and to keep the mines going additional sums were required, which reached 23,000 mks.

## BOOKS RECEIVED.

**[In sending books for notice, will publishers, for their own sake and for that of book-buyers, give the retail price? These notices do not supersede review in another page of the Journal.]**

*Microscopical Physiography of the Rock-Making Minerals.* An aid to the Microscopical Study of Rocks. By H. Rosenbusch, translated and abridged for use in Schools and Colleges, by Joseph P. Iddings. Published by John Wiley & Sons, New York, 1888. Illustrated. Pages 333. Price, $5.00.

*The Steam Boiler Catechism.* By Robert Grimshaw, M. E. Published by the Practical Publishing Company, New York. 1888. Illustrated. Pages 402. Price, $2.

*Kentucky Geological Survey.* Jackson's Purchase Region. By Prof. John R. Proctor. Director of State Geological Survey. 1888.

## MAP RECEIVED.

*Mineral and Geological Map of the District of Catorce, State of San Luis, Mexico.* By David Coghlan, Mining Engineer. Published with the approval of the Governor of the State and the mining authorities of the District.

## DIVIDENDS PAID BY MINING COMPANIES DURING OCTOBER AND FROM JANUARY 1st, 1888.

| Name of Company. | Paid in Oct. | Since Jan. 1. | Name of Company. | Paid in Oct. | Since Jan. 1. |
|---|---|---|---|---|---|
| Atlantic, Mich | ..... | 120,000 | Little Chief, Colo | ..... | 20,000 |
| Aturas, Idaho | ..... | 112,500 | Mammoth, Utah | ..... | 30,000 |
| Bos. & Mon. Cop., Mont. | ..... | 200,000 | Mary Murphy, Colo | ..... | 35,000 |
| Calumet & Hecla, Mich. | ..... | 1,500,000 | Montana Lt., Mon | 41,250 | 412,500 |
| Carlisle, N. M. | ..... | 110,000 | Morning Star, Colo | ..... | 25,000 |
| Central, Mich. | ..... | 70,000 | Mt. Diablo, Nev | ..... | 40,000 |
| Colo. Central, Colo. | 13,750 | 68,750 | North Belle Isle, Nev. | ..... | 200,000 |
| Confidence, Nev. | ..... | 174,720 | N.Y. & Honduras R., C.A | 15,000 | 45,000 |
| Cons. Cal. & Va., Nev. | 108,000 | 1,080,000 | North Star, Cal. | 50,000 | 100,000 |
| Copper Queen Con., Ar. | 70,000 | 140,000 | Ontario, Utah. | 75,000 | 750,000 |
| Crescent, Utah | 18,000 | 18,000 | Original, Mont | ..... | 3,000 |
| Daly, Utah | 37,500 | 412,500 | Osceola, Mich. | ..... | 150,000 |
| Deer Creek, Idaho | 10,000 | 10,000 | Parrott, Mont. | 36,000 | 108,000 |
| Dunkin, Colo | 10,000 | 90,000 | Pittsburg, Cal. | ..... | 29,860 |
| Eureka, Nev. | ..... | 87,500 | Plymouth Cons., Cal | ..... | 80,000 |
| Franklin, Mich | ..... | 12),000 | Poorman, Colo. | ..... | 10,000 |
| Garfield, Nev. | ..... | 25,000 | Quicksilver, Cal., Pref. | 53,750 | 290,250 |
| Golconda, Idaho | ..... | 120,000 | Quincy, Mich. | ..... | 360,000 |
| Granite, Idaho | ..... | 10,000 | Sherwood, Mo. | ..... | 3,000 |
| Granite Mountain, Mont | 200,000 | 1,600,000 | Sierra Buttes, Cal. | ..... | 15,312 |
| Hale & Norcross, Nev. | ..... | 224,000 | Sierra Nevada, Idaho | ..... | 10,000 |
| Hecla Cons., Mont | 15,000 | 150,000 | Silver Mg. of L. V., N.M. | ..... | 25,000 |
| Homestake, Dak. | 25,000 | 250,000 | Standard, Cal. | ..... | 50,000 |
| Hope, Mont. | ..... | 50,000 | Swansea, Colo. | ..... | 3,000 |
| Hubert, Colo. | 5,500 | 69,500 | Tamarack, Mich. | ..... | 440,000 |
| Idaho, Cal. | 23,250 | 286,750 | Viola Lt., Idaho | ..... | 37,500 |
| Iron Silver, Colo. | ..... | 200,000 | | | |
| Jay Gould, Mont. | ..... | 172,000 | Total | 807,000 | 10,743,642 |

## PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent-Office.

PATENTS GRANTED OCT. 30TH, 1888.

391,797. Electric Motor. Walter E. Hyer, Newburg, N. Y.
391,803. Lubricator. Robert E. Lee, New Orleans, La.
391,809. Hydraulic Motor. John E. Mick, Portsmouth, Ohio.
391,819. Apparatus for Burning Oil for Fuel. Samuel H. Robinson, Chelsea, Mass., Assignor to Marcus M. Merritt, trustee, same place.
391,852. Rotary Pump. William W. Lockwood, Freeport, Kan.
391,873. Furnace Feeder. William E. Allington, East Saginaw, Mich.
391,892. Rotary Engine. James I. Friar, Pascagoula, Miss.
391,899. Rock Drilling Implement. Daniel Kilpatrick, Morning Sun, Iowa.
391,918. Bearing for Turbine Water Wheels. George L. Richardson, Brunswick, Me.
391,926. Coal-Washer. Sebastian Stutz, Pittsburg, Pa.
391,971. Sand-Blast Apparatus. Henry A. House and Henry A. House, Jr., Bridgeport, Conn., Assignor of one third to E. Emmons Graves, same place.
391,980. Metallurgical Furnace. Terrence McSweeney, Allegheny, Pa.
391,994. Method of Drawing Tubes. Wilhelm von Flotow and Herman Leidig, Dantzic, Prussia, Germany.
392,017. Water-Motor. Richard Emerson, Racine, Wis., Assignor of one half to the Racine Malleable and Wrought Iron Company, same place.
392,031. Device for Vaporizing and Burning Vaporized Liquid Hydrocarbons. William H. Holmes, Brooklyn, N. Y., Assignor of one half to Joseph E. Smith, same place.
392,054. Valve for Air Compressors. Henry P. Morgan, South Norwalk, Conn., Assignor to the Norwalk Iron Works Company, same place.
392,103. Electric Conductor. Henry F. Campbell, Concord, N. H.

# THE METALLURGY OF STEEL.*

By Henry M. Howe.

(*Continued from page* 353.)

Chernoff obtained the following results. Of three samples broken from the same bar of steel, A was simply cooled slowly after forging: B was reheated to W[a] and slowly cooled: C was reheated to W,[b] quenched in water to a reddish brown, then slowly cooled. The size of grain was as follows:

TABLE 87.—EFFECT OF COFFIN'S PROCESS ON SIZE OF GRAIN.

| | Mean diameter of central grains. | |
|---|---|---|
| | Inches. | Mm. |
| A, slowly cooled after forging | 0·1414 | 3·675 |
| B, reheated to W, then slowly cooled | 0 0048 | 0·122 |
| C, reheated a little higher than B, quenched to V, then slowly cooled | 0 0004 | 0 010 |

A broke under a single hand-hammer blow, B required five such blows, C could be broken only by a steam-hammer. Of a similar series from a railway-tyre, A broke under one blow of a 5-ton hammer, B under four blows, and C under five heavy blows.

In thus quenching nearly to V instead of barely below W as he himself thought sufficient, Chernoff practically used Coffin's process in these cases, but apparently blindly, and without recognizing its nature or advantages, for clearly he believed that no important crystallization occurred below W. Hence in practicing his own process, he and others might often or even habitually cool to but slightly below W instead of to V.

The rail-process seems specially adapted to rolled, the axle- to hammered pieces: for the time offered for crystallization in one part of a hammered piece after it has been hammered, and while the remainder of the piece is hammering, may permit much crystallization, which simple quenching would not remove, but which is removed when the temperature is later raised to W. Beyond this the more expensive axle-process should give a finer fracture and hence better quality than the rail-process.

These methods differ from Jarolimek's interrupted cooling (p. 24), in that, while retaining a fine-grained structure, they aim to avoid hardening. Lead-hardening[c]—quenching in molten lead, said to be used in France for armor-plates[c]—should give an intermediate result, retaining part of the carbon in the hardening state, while setting up far less severe stresses than those due to oil-quenching. The severity of these has led many eminent engineers—among them Adamson, Bramwell, Maitland and J. Riley,—to question the advisability of oil-hardening.[d] It seems probable that hardening must in many cases, *e. g.* those of guns, projectiles and armor-plates, be made less severe than at present, retaining much of the carbon in the hardening state, but avoiding great intensity of stress, whether by less violent cooling, (as with molten lead): or by interrupting or retarding the cooling after it has passed a certain point, (as by dipping momentarily in oil, then in lead, or vice versa, according to the conditions of the case): or by tempering after hardening.

*To Find the Temperatures W and V.*—A cold steel bar, preferably but not necessarily of like composition with the steel to be treated, and about $\frac{3}{4}''$ square by four feet long. is placed in a hot furnace, its ends resting on two bricks. When its temperature reaches W it will bend down suddenly. Remove and support it at its ends in the open air: when its temperature falling reaches V, it will again bend suddenly. Da capo, quantum libet. (Cf. § 254, B, 3, and § 256, D).

Or heat such a bar to redness, nick all around at nine points half an inch apart, the first next to one end; cool gently; heat this end to dazzling whiteness, the heat running back by conduction till the last nick is nearly red; note the temperature at each nick; quench; wipe; break at the nicks. That which has the finest grain was nearest W when quenched.

In these methods of heat-treatment the temperature is usually gauged by eye: this is simply barbarous. As slight changes of temperature seem to produce great effects, a pyrometer should be employed in treating important pieces—guns, marine shafts, gears, etc. From the systematic study of heat-treatment, of whose effects our present knowledge is fragmentary, and the adoption of intelligently devised methods, enormous advantages may be expected.

### CHANGES OF CRYSTALLIZATION, ETC.

THE SALIENT FEATURES OF CRYSTALLIZATION can now be considered in a more general way.

§ 251. *Governing Crystallization.* The following cases, though insufficient to establish, go to show that in the struggle for dominance between the component minerals of steel, those (1) which separate earliest and (2) those most abundantly present are best equipped: one of these will usually determine the general structure of the mass, and distribute the others, often as a meshwork between its own crystals.

Sorby finds that, in those parts of wrought-iron which have but little pearlyte, this mineral is distributed as a meshwork between the crystals of ferrite: in adjoining regions, where pearlyte is in relatively large proportion, it apparently has crystallized first and distributed the ferrite between its crystals. So, too, in cast-iron: in grey iron, rich in graphite, the graphite appears to have crystallized first and determined the structure of the whole: in No. 3 pig-iron Sorby finds that, in those regions which contain the most graphite, this mineral appears to govern the crystallization, and we may surmise that this happens because, though the total quantity of graphite is small, yet, owing to its high melting point, it tends to crystallize very early. In the less graphitic portions of the same pig the pearlyte appears to govern the crystallization of the whole, and so it does throughout the still less graphitic forge pig.

Again, in refined white cast-iron, in which there is about twice as much pearlyte as cementite, the pearlyte seems to govern: in spiegeleisen these two minerals are in about equal proportions, and here cementite seems to govern.

§252. RECRYSTALLIZATION.—We can readily understand that the minerals thus distributed as a meshwork between the crystals of their more powerful elder brothers should be in unstable equilibrium, and that, when opportunity offers, they should seek to acquire their normal crystalline polarity, to break their bonds, to crystallize

* Copyright by the Scientific Publishing Company, 1887.

a "Un peu au-dessus du rouge clair non brillant."

b "Au rouge clair." Thus the second piece may have been raised to a little higher temperature than the third: yet hardly enough to account for the great difference in the size of their grains.

c Gautier, Jour. Iron and St. Inst., 1888, I., p. 159.

d Maitland, "The Treatment of Gun-Steel," excerpt Proc. Inst. Civ. Eng., LXXXIX., pp. 21, 48, 58, 77, 129; 1887. It appears to be no uncommon thing for hardened steel projectiles to crack or even burst. Bramwell states that a visitor to a projectile-factory was warned lately that "those things are going off at all times, and occasionally they fly with very considerable violence," (Prince Rupert's drops one would say) and that a steel gun-tube has broken to pieces in the lathe.

anew. So, too, crystals which have been distorted by forging or by the interstratal motion due to quenching, and crystals of minerals new-created by change of affinities due to change of temperature as at V and W, should seek, the former to recover, the latter to attain their normal polarity. Those whose growth has been dwarfed by short or feeble heating may, when softening high temperature again permits, remarshal their squads into platoons, companies, regiments, the aggregating crystalline tendency asserting itself and forming larger and larger crystals. Each crystal in growing must feed on its neighbors, drawing a little perhaps from the mesh-work which surrounds it. Hence, if the average size of the crystals is to increase, some must cease to exist, must merge in their neighbors. If, be it from more robust individuality, be it because separated by a greater thickness of mesh-work, the neighbor on one side resist assimilation more stubbornly than that on the other, growth will be uneven: while under extremely favorable conditions, *e. g.* during very long strong heating, these asymmetrical grains may give and take till symmetrical cubes or octahedra result. And such is the case.

The structure of many minerals, *e. g.* magnetite, reminds us in one respect of that of iron. We find the grains usually of most irregular shape, approaching by insensible gradations, as conditions are more and more favorable, to the almost absolute perfection of crystalline form which individual magnetite crystals occasionally show. So too in granular iron, the grains, usually irregular, under favoring circumstances are occasionally extremely well developed crystals; and between the two extremes the gradations appear as insensible as in case of magnetite.

Hence we may regard the uneven, asymmetrical but often smooth-faced grains as very imperfect crystals, or at least as fragments of crystals broken through their cleavage planes.[a]

Finally, special conditions may force a certain mode of growth, to which the metal is not naturally inclined: on heating after these conditions have ceased to exist, these quasi abnormal crystals may readily give way to more normal ones. Such are the columnar crystals forced on solidifying steel ingots by the rapid removal of heat by the mould, and removed by simple reheating.

Our fracture studies tell us little of the nature of the crystalline changes which they record: but of this nature something has been learnt from polished sections. We will now consider certain prominent cases of recrystallization, and incidentally certain features of the initial crystallization.

§ 253. Recrystallization on Slow Cooling from the Melting Point.—In an ingot of hard cast steel there are, to judge from Sorby's description, the records of three successive crystallizations. First we have the large prismatic columnar crystals, normal to the cooling surface, and conspicuous on fracture (Figures 64, 65 and 68). They apparently represent the first crystallization, be it of hardenite, be it of the suppositious mother-of-pearlyte, which in this case has expelled the excess of cementite present, distributing it as an elongated mesh-work between the crystals. Secondly, these columnar crystals are chiefly composed of groups of pearlyte, disposed with little or no relation to the columnar structure, indeed shooting from one column into another, and apparently formed from the substance of the primary crystals by a second crystallization. Finally, by a third crystallization, each of the individual members of the radial groups of pearlyte has split into parallel layers of cementite and ferrite, which apparently occupy the space previously occupied by a simple undivided crystal.

The composite ingot-structure, recognized in large part by color-differences and by the use of high powers, is shown very imperfectly by photography, Figure 63 A.

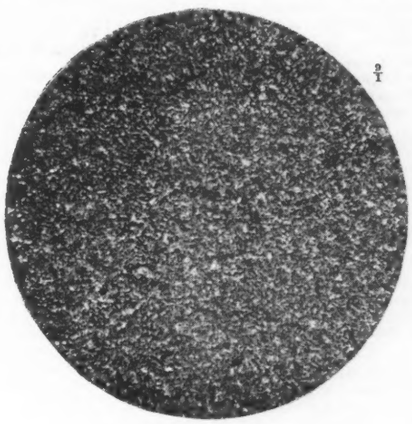

**Fig. 63A.**

Transverse section of cast-steel ingot, Sorby. Nearly wholly pearlyte.

So Osmond and Werth, on etching the polished section of an ingot containing 0·50% of carbon, find that it is composed of (a) simple cells in (b) dendritic, mutually limiting groups, and these again may form (c) complex coverless agglomerations.[b]

In connection with these evidences of repeated recrystallization, it is interesting to recall the repeated evolutions of heat during the slow cooling of iron, which manifest themselves by retarding or even reversing the fall of temperature (§§ 254–7).

*This columnar ingot-structure* is the less marked the freer the steel from carbon, perhaps because the soft steels pass less directly from the liquid to the solid state than the harder ones, the pasty condition which characterizes their solidification being opposed to the formation of crystals.[c] In small ingots, say three inches in diameter, the columns may extend to the centre (Figures 27–8, § 222, p. 148): in larger ones they form an external layer, which often ends quite abruptly, and is succeeded by a region with a granular or polyhedral structure. The columnar crystals adhere to each other comparatively feebly: this favors external cracking, both in cooling and in the early passes in the blooming mill. These cracks usually pass between the columnar crystals, revealing their surfaces, rather than across them. Figures 64–5 show bunches of these crystals in my collection, from the outside of a "cobble" or ingot which cracked so badly that it had to be cut up. In Figure 64 the columns have been twisted by the rolls: the granular structure is also seen. Figure 68 shows the columnar structure, and its abrupt change to the granular.

(TO BE CONTINUED.)

[a] Thurston indeed thinks that granular structure is confounded with real crystallization: and that granular fracture and crystalline structure are apparently distinct in nature (Mat'ls of Engineering, II., pp. 579–82). Most of us, however, would accept the dictum "All granular and fibrous (inorganic) bodies"—"must be regarded as collections of imperfectly formed crystals," at least for cases like the present. (Watts, Dictionary of Chemistry, II., p. 115).

**NOTE.—The publishers of the ENGINEERING AND MINING JOURNAL will thank the readers of this article if they will promptly call attention to any inaccuracies they may observe in it.**

[b] Annales des Mines, 8th ser., VIII., p. 13, 1885.

[c] Chernoff, Rev. Universelle, 2d ser., VII., p. 139, 1880.

## PERSONAL.

Mr. E. E. Olcott, Mining Engineer, New York, has returned from Dutch Guiana.

Mr. C. DeF. Hawley, metallurgist, has gone to China to take charge of reduction works in that country.

Prof. J. E. Clayton, mining engineer, of Portland, Oregon, is about to make a further examination of the mines of the Montana Company, Limited, of Montana.

Mr. Thomas H. Leggett, mining engineer, has gone to Panama, Republic of Colombia, and can be addressed there care of the Darien Gold Mining Company, Limited.

We learn that Mr. Chadwick, who has been connected with several doubtful Dakota schemes, is in London, trying to float the Hermosa Gold Placer property of Dakota.

Professor James Hall, New York State Geologist, has been invited by the Commissioners of the Niagara State Reservation to prepare a report on the geology of the Niagara region.

Professor F. W. Clark of the geological survey has been appointed to represent the Interior Department of the United States at the Cincinnati Exposition, vice Marcellus Gardner, deceased.

Mr. D. S. Mathias, has been appointed Superintendent of the South Chicago Works of the North Chicago Rolling Mill Company, to succeed J. W. McGinnis, who resigned a short time ago.

Mr. Arthur Macy, to whose resignation as superintendent of the Silver King Company, of Arizona, we referred some time ago, last week turned over the conduct of the business to his successor, Mr. Adams.

Mr. J. A. L. Waddell, civil engineer, of Kansas City, Mo., and formerly of the University of Tokio, has received the order of the Rising Sun, with the rank of Knight Commander, from the Emperor of Japan.

Mr. Thomas Alexander, Professor of Engineering at Trinity College, Dublin, has received from the Emperor of Japan, in recognition of services at the Imperial University of Japan, the Order of the Rising Sun fourth class.

Mr. J. E. Mornish, an English mining man, lately from South America, has passed through New York, on his way to Arizona to take charge of the Kaiser Gold Mines, Limited, to which we referred in our issue of October 20th.

Mr. S. F. Emmons, Geologist-in-Charge of the Rocky Mountain Division of the Geological Survey, has been seriously ill with typhoid fever in Denver, Colo. The crisis is past, and his many friends will be glad to know that he is improving.

Mr. John D. Prince, a well-known Brooklyn business man, died in that city on the 27th ult. He founded the paint house of John D. Prince's Sons, and held important positions in several financial institutions and railway corporations.

Mr. John Trageser, who has been prominently identified with the copper trade of New York for many years, died on the 23d inst., aged 66 years. During his entire life Mr. Trageser has been engaged in the copper manufacturing industry, and at the time of his death he was President of the John Trageser Copper Works.

Mr. A. E. Wood, Mining Engineer, of Birmingham, Ala., has received the appointment of Superintendent of the mines of the Fire Creek Coal and Coke Company, of Fire Creek, West Va. Mr. Wood is one of the many professional gentlemen who has received his appointment through the services of the ENGINEERING AND MINING JOURNAL, which publishes free every week the list of positions vacant.

Mr. N. J. Mitchell, of Pittsburg, Pa., is at the head of a movement to organize a scientific iron, steel and engineering society, to consist of young men between the ages of 18 and 25 years. This society is for the mutual instruction on everything pertaining to the above subjects, including mining and working of metals, civil and mechanical engineering, as well as the application of electricity. Young men of the above ages interested in such a movement can address Mr. Mitchell at the Hamilton Building, Pittsburg.

Mr. Charles H. Phillips, for many years a prominent manufacturer of chemicals in New York and president of the C. H. Phillips Chemical Company, died suddenly on the 29th ult. of apoplexy. Mr. Phillips was an Englishman by birth. Coming to this country when a young man he engaged in the drug and chemical business, and by his integrity and faithful attention to business built up a large fortune. He was a member of the Geographical Society, a director in several corporations, and connected with all the prominent societies in his line of business.

## INDUSTRIAL NOTES.

The fire has been lighted in the new furnace of the Oregon Iron and Steel Company at Oswego, Ore. Work was also begun in the company's iron pipe foundry.

Mr. Geo. Y. McMurtry, manufacturer of hot-pressed nuts, at Pittsburg, Pa., has disposed of his entire interest in the business to the Iron City Manufacturing Company.

The Junction Iron Works and the Laughlin & Junction Steel Works, at Mingo Junction, Ohio, have been closed down indefinitely owing to a disagreement between the management.

Mr. John Young, of Pittsburg, Pa., has been shipping the sheet-iron work for the smelting plant to be established at Tientsin, China, under the auspices of the Imperial Government.

The Ashland Iron and Steel Company's furnace at Ashland, Wis., last week ran out 87 tons of No. 1 charcoal iron, said to be the largest output ever made by a charcoal furnace in the United States.

The Appleton charcoal iron furnace, at Appleton, Wis. was destroyed by fire on the 28th ult. The loss upon the plant is total, and amounts, it is said, to $40,000, together with a heavy loss on iron ore, coal and wood in stock which cannot as yet be estimated.

Nebraska is to lose its only rolling mill, as it is reported that the plant of the Union Steel Nail Company, at Omaha, is to be removed to St. Joseph, Mo. Upon its removal it will be greatly enlarged and modernized. The title of the corporation is to be changed to the Union Steel and Iron Company.

A partial resumption of the plant of the Wheatland Iron Company, Wheatland, Pa., took place last week, and it is expected that in a short time all departments will be in full operation. Skelp iron of large sizes will be the principal product, of which the plant will have a capacity of about 300 tons every 24 hours.

The erection of the plant for the navy gun foundry at the Washington, D. C., navy yard is progressing rapidly. Babcock & Wilcox have forwarded the boilers, and the Morgan Iron Works have delivered the iron for the traveling crane. The plant for the heavy gunconstruction will be ready for active operations early next spring.

Messrs. James McNeil & Bro., of the Vulcan Tank and Boiler Works, at Pittsburg, Pa., have a contract for making pipes for the Philadelphia Gas Company. These pipes are 36 inches in diameter, and are made from what is known as heavy plate iron, used for making tanks or boilers. Each connection of pipe is 40 feet long, and at each end is connected together by an expansion link.

The nail factory of the Belmont Nail Company, at Wheeling, W. Va., is in full operation, with the exception of the small nail machines, which are idle for an indefinite period, and will remain closed until such time as the men can agree that they may be run upon a basis that has been adopted by other mills and which will enable the company to meet a fair business competition.

It is reported that the Grant Locomotive Works at Paterson, N. J., are soon to be removed to Chicago. The exact location of the shops, it is believed, has not yet been definitely chosen, but the company's representative has secured options on several tracts of ground which may be advantageously used for the purpose proposed. It is said that Chicago has been selected after a careful survey of advantages offered by other Western cities.

The North Chicago Rolling Mill Company is now running fourteen boilers at its South Chicago Works exclusively with oil for fuel. Thus far the results have been satisfactory, but the managers of the company are not prepared as yet to express a definite opinion in regard to it. The oil is now being conveyed to the works in tanks, but a pipe line is contemplated from the South Chicago storage tanks, which will probably be built as soon as the tests now being made are pronounced conclusive.

The flint bottle manufacturers of the western district, composed of the bottle makers from all over the country west of the Alleghenies, met at Pittsburg, Pa., last week, to consider the formation of a trust. It was decided to call a meeting at an early day of all the bottle manufacturers of the country to discuss means of putting prices on a more profitable basis. It is stated that the trouble lies in the enormous increase of bottle factories in the West during the last five years. The resulting brisk competition has broken prices almost 50 per cent.

Hon. John H. Bailey, assignee of the firm of Graff, Bennett & Co., has filed a petition in Common Pleas Court No. 2, Pittsburg, Pa., asking for permission to sell the remainder of the firm's assets to a syndicate of the firm's creditors, whose claims aggregate $450,000. The property of the firm still in the hands of the assignee consists of several small pieces of real estate scattered throughout the country, a large number of uncollected accounts and interests in other firms, some of which are uncertain and indefinite, and others of which are in litigation. The syndicate offers to pay $50,000 for these assets, this sum to be deducted from the dividends due the creditors who form the syndicate.

The Beckett Foundry and Machine Company, of Arlington, N. J., has just shipped one of its steam hoists to the estate of J. Couper Lord for one of their iron mines at Port Oram, N.J. The hoist has two steam cylinders 15 inches diameter by 24 inches stroke of piston, and two drums 6 feet diameter by 4 feet long, each fitted with powerful jaw brakes and steel band friction driving arrangement. The drum shaft is 8 to 9 inches diameter by 24 feet long, supported by four heavy bearings. The main driving spur wheel is 12 feet diameter by 10 inches face and 3 inches pitch. The total weight of this machine is about 26 tons. Any one interested in hoisting machinery can see the same, as the mines where this hoist is will shortly be in full operation.

## CONTRACTING NOTES.

Our list of machinery and supplies wanted will be found on page xiv. Manufacturers of machinery, engineers and contractors should consult our directory of "Contracts Open" on the same page. This week, proposals are invited for the following new contracts: No. 1152, Furnishing Boiler; No. 1153, Construction of Water-Works System; No. 1154, Construction of Pier; No. 1155, Building Iron Bridge; No. 1156, Building Iron Bridge; No. 1157, Water-Works Construction; No. 1158, Sewer Construction.

The Westinghouse Electric Company, of Pittsburg, Pa., has been awarded the contract for a central station plant in the city of London, England. The contract calls for 25,000 16 candle-power incandescent lamps, and is much larger than any contract previously obtained by the company.

## GENERAL MINING NEWS.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including October 24th, as reported by the Marquette *Mining Journal*, were as follows:

| | Tons. 1888. | Tons. 1887. |
|---|---|---|
| Marquette, Marquette District | 730,238 | 740,947 |
| St. Ignace, " " | 102,313 | 86,930 |
| Escanaba, " " | 710,896 | 794,444 |
| " Menominee District | 962,190 | 1,018,198 |
| " Gogebic District | 168,129 | ..... |
| Ashland, " | 932,322 | 988,036 |
| Two Harbors, Vermillion District | 368,385 | 357,774 |
| Total tons | 3,974,473 | 3,968,329 |

A report having reached General Master Workman Powderly that the miners belonging to the Knights of Labor and the Federation of Miners and Mine Laborers have in contemplation the formation of a new and distinct organization at the joint convention to be held at Columbus, Ohio, early in December, he has written a letter to the miners' assemblies throughout the country requesting them to carefully consider the step before taking it. If there is anything about the Knights of Labor that is obnoxious to the miners, if complaint is made to him, he says, he will lay the matter before the General Assembly at its next meeting, and endeavor to have it remedied.

Efforts are being made now to organize a federation of miners of the Lake Superior district, to embrace the mines of the Marquette, Menominee, Gogebic and Vermillion iron ranges and the entire copper district.

### GOGEBIC IRON RANGE NOTES.

[From our Special Correspondent "Ossipee."]

The season of 1888 is nearly over, and our mines are getting ready for next year in addition to mining such ore as is necessary to fill out the balance of their contracts. Of course the amount of ore actually opened up and ahead is not very much. That is the usual hand to mouth principle of Lake Superior Iron mines. Yet knowing what we now do of the nature and position of our ore-bodies we can form a very fair estimate of what next winter's work will develop.

Beginning at the west end of the range the following is the condition of the mines.

The Father Hennepin mine is growing larger every day, and its lens of ore has proved to be the best on the range, cargo lots in every case going over 67 per cent in iron, phosphorus less than ·030 per cent. It is proposed to sink a new four-compartment shaft in the foot wall to mine the ore-body farther east. The drift on the second level is being run east to prove up the ground before the new shaft is sunk. This second level is the same as the fourth of the Pence. The Father Hennepin, it will be remembered, had 180 feet of surface to go through before the ledge was struck. Ore was struck immediately under the sand.

The Montreal is looking very well. Their new West shaft, west of No. 5, is almost in clean ore, only a little rock being visible. A new working shaft is being sunk on the western north vein lens. Cross-cutting from the north vein to the south vein is also in progress. No. 4 and No. 9 shafts are both improving in regard to the amount of ore in right. Shipments to Ashland have been discontinued. There is considerable talk of sinking a shaft to strike the Father Hennepin body of ore, which is pitching directly into the Montreal.

Section Thirty-Three mine, next east from the Montreal, has two shafts in clean ore, one cutting the north vein and the other the south vein lenses of the Montreal. The prospects for this mine for 1889 are excellent.

The Superior and the Germania are still shipping. I have not visited them, however. Every thing else on the Wisconsin side is idle except the Iron Belt and some explorations.

Among these latter the Tyler's Fork has a good showing—20,000 tons of ore being in sight.

The Ashland has just struck ore at No. 6 shaft with the diamond drill at a depth of 120 feet below the bottom of the shaft. Sinking has been resumed. This shaft was already 100 feet below the lens of ore in which it was started, making a total of 220 feet of poor ground between the two lenses of ore. It is supposed this new ore is the same body that shafts Nos. 3 and 4 are working on. No. 5 shaft will be abandoned as unnecessary.

The Norrie with its magnificent unequaled record of over 360,000 tons of ore to date, which will reach 400,000 ere new year, for this season's work, is in excellent shape. Eight shafts on the property are all either bottomed in ore, or if in the foot have cross-cuts from their lowest level to ore. A winze has just been

started east of the shaft pillar of No. 6 shaft at the fourth level, and will be sunk to drain the way for the sinking of the shaft. A half million tons from the Norrie in 1889 will be an easy task.

The Aurora has No. 4 shaft sunk to the fifth level. The drift east is under No. 5, and raising in progress. The drift west is not yet under No. 3, which, however, is dry and is being sunk from the fourth to the fifth. The M., L. S. & W. Ry. is extending the foot-wall spur of No. 6 shaft, so as to take in Nos. 5, 4, and 3 on their footside and thus obviate the expensive tram from those shafts. No. 5 shaft will be stripped up along the foot-wall this winter, so as to fit the new spur and get rid of the piece just below the present shaft-house. Preparations are also being made to use coal under the mine boilers.

The Pabst has just completed the year's shipment of 50,000, and sinking has begun on Nos. 4 and 2 shafts, south vein. One hundred feet deeper on No. 4 it is expected will cut the Aurora lens. A winze is down 25 feet from the 200 foot level of the north vein workings in 63 per cent. ore, and sinking of the north vein or "Major Baetz" foot wall shaft has begun. An era of success for the Pabst under the management of Captain Stephens, who discovered the north vein on the property, is now assured.

The Iron King is looking much better east of No. 3 shaft. In the last room east the ore is four sets high and no capping yet. Near the shaft the ore only made two sets high. Shipments were concluded Friday last by vessel, and shafts No. 1, 2, and 4 will be sunk deeper immediately. Work in shaft A, on the south vein, formerly called No. 5, will be resumed this winter. The plant of boilers and machinery is being moved to the foot-wall of the south vein, and two new drums are being set up. The new Lake Shore spur to shaft No. 2 and 3 is complete, and the erection of the new shaft houses is all that retards its use. Shaft No. 1 is connected with the drift west from No. 2, the pocket is up, and the spur built. Considerable ore has been hoisted during the last month from it.

The Bonnie, now under the same management as the Iron King, is sinking a new shaft on the north vein to cut the thirty feet of ore found in the down-right exploring shaft last year. Work on the south vein will be resumed as soon as a new boiler is set up.

The Ruby, formerly the Puritan, is looking well. The 200-foot level has developed a body of ore 80 feet long and 20 feet wide west of the main shaft No. 4. The shaft is now down to the 300-foot level, and drifting will be begun as soon as the landing room is cut.

The Ironton began last week to sink their shaft, No. 1, 100 feet deeper to reach the ore found this summer with the diamond drill. Air from the Ruby compressor is carried 1500 feet to the shaft to operate the power drill pump and pony hoister. The Ironton diamond drill, a No. E Sullivan, is now at work on the bottom level of No. 1 shaft of the Ruby, and is the same drill with which the Ironton ore and the Ashland ore in No. 6 was struck. The Ruby people hope it is a mascotte.

The Federal Mine, formerly the Tontine, has just secured a lease from the Canal Company, the requisite 10,000 tons called for in the option being in sight. Five thousand tons have been sold to the Black River Falls furnace for immediate shipment. The second level is being prepared for active mining.

The Colby returns on November 1st to the hands of the Penokee and Gogebic Development Company, Mr. Sellwood going to the Vermillion Range as general manager of the Chandler mine. The name of the new manager is still unknown. Over fifty applications for the position have been made. The last six months' work has made a vast improvement in the prospects of the mine, the south vein soap-rock dyke having feathered out to nothing at the east end of the mine. The pillars on the fifth level of No. 4 shaft have been made large, seven set pillars and five set rooms, and Mather, Morse & Co. leave the mine in excellent shape. No. 5 shaft, or a new one east of the present opening called No. 5, will probably be sunk immediately.

The Palms has a good record this year of about 20,000 tons, under the careful management of Capt. J. P. Christopher. The prospects for the Palms this Spring when Christopher took hold were not encouraging.

The Anvil has been left by the contractors in pretty bad shape, with but little ore, but a fair-sized lawsuit in sight. Every level of No. 1 shaft is caved down, but before the third level was let down the bottom looked well. No. 1 shaft, in the quartzite, will probably be abandoned, and No. 2 made the main shaft.

The Brotherton output this year will reach 60,000 tons. The mine looks well, but must have some more machinery for next year.

The Sunday Lake has been troubled with water this season. The mine is down to the fifth 50-foot level, and looking well. A trial will be made this winter, east of No. 3 shaft of the Brotherton system of mining, a system similar to that used in Low Moor, and described at the last meeting of the American Institute of Mining Engineers.

Exploration east of the Sunday Lake is lively and at least one new mine should ship in 1889. Work is being done on the Commercial Eclipse, Joliet and the Crown Point just west of the Brotherton.

Ore has been found at the Pilgrim, half way between the Anvil and the Brotherton. The old Speedwell is under option and will soon sink a shaft near the Pilgrim line. The Mikado is soon to pump out the shaft. The Mound City, the Bond (formerly Miner and Wells), the Standard and the East Anvil (now the Dangler) are all at work. The Norrie people are exploring on the First National abandoned by the Bessemer Consolidated Iron Co.

The prospects for 1889 are excellent. Our output this year, Michigan and Wisconsin together, will exceed 1,300,000 tons, and a conservative estimate of 1,600,000 for 1889 can easily be performed. Our ore is holding out in quantity and quality, and exploration has revived.

The rails of the Duluth, South Shore & Atlantic Railway branch to the range are laid beyond Bessemer, and 1889 will find us with a third road ready to carry ore to Marquette or St. Ignace.

## CALIFORNIA.

### MONO COUNTY.

MONO MINING COMPANY.—All the repairs have been made to the machinery at the Lent shaft, and pumping has been resumed. As soon as the water is out prospecting will begin on the lower levels of this mine.

## COLORADO.

### ARAPAHOE COUNTY.

The promoters of the scheme to secure natural gas for Denver are again at work endeavoring to form a company. The work done in this respect last spring did not meet with an enthusiastic response. The present plan is to form a stock company of $15,000 for the purpose of prospecting for oil and gas.

### CLEAR CREEK COUNTY.

PELICAN-DIVES.—This property was recently sold under mortgage sale, and bid in by the bondholders for $150,000. This is a preliminary matter to a full reorganization and a starting of new developments on this property.

### GILPIN COUNTY.

On and after October 27th the sampling works at Black Hawk will be run upon much the same plan as followed at Swansea, Freiberg, Salt Lake, and Denver. Ores offered for sale will be sampled and assayed at Black Hawk. Samples and assays will be forwarded to the different ore purchasers, both smelting companies and agents, the Boston & Colorado Smelting Company, Omaha & Grant Smelting and Refining Company, Holden Smelting Company, of Denver, and the Pueblo Smelting and Refining Company and Philadelphia Smelting and Refining Company, of Pueblo, together with any others likely to purchase. By this plan any one can bid without extra expense of maintaining an agency at this point, and say what price will be paid at the common point of Denver. The Sampling Company proposes also to attend to the shipping and sale of ore and tailings in car-load lots direct to the smelters. Empty cars will be ordered and smelters' check and statement given to owner. For this service a small charge per ton will be made. The assaying and business office of the company will be in Black Hawk at sampling works.

WHITING.—A retort, the result of a thirty days' run from this mine of Central City, weighs 2345 ounces, nearly 160 pounds, and is valued at $39,000.

### LAKE COUNTY.

CHRYSOLITE SILVER MINING COMPANY.—The company has just issued the following statement: During the past year the operations of the company have failed to develop any new ore-bodies. They have consisted of: *First*. Extractions from the old workings, by contract or otherwise, of as much material as could be sold to smelters at a price that would pay the expense of mining and delivering it This has been done in the hope of finding here or there pockets of silver ore, which, at Leadville, occurs, associated with and buried in the comparatively valueless iron ore. *Second*. Similar operations by lessees in parts of the property leased to them. Considerable amounts of money have been thus expended by lessees, but so far without profit. *Third*. Explorations at the company's expense in new ground. The amount of ground still unexplored is considerable; and it is impossible to say positively that insome parts of it (especially in parts where "iron" bodies are known to exist) there may not be paying bodies of silver ore, although continued ill success so far is an increasing discouragement. This exploring work is, of course, a dead expense; but, while the cost has been reduced in every possible way, every exploration that seemed to offer a chance of success has been undertaken. *Fourth*.—Overhauling and jigging the old dumps, to extract whatever could be saved from them and sold to smelters. This work can only be done in the summer, when water is available. It is about over now for this year, and it is not certain whether there is enough material left for another season. There has been some profit in it, which has helped to pay other expenses. The earnings from the first and fourth classes of work above named have not been quite sufficient to pay for the exploration work, and for the necessary office expenses.

The balance in the treasury is now about $29,000, but this will undoubtedly be further reduced before spring if explorations should be continued during the winter. There seems no other course practicable than to go on using this money as prudently as possible in testing the remaining ground of the company.

The usual reports, giving details of the year's work, will be prepared and issued to the stockholders as soon as practicable after the annual meeting. Delay in their preparation may be expected this year, as last, by reason of the reduced clerical force at Leadville and New York.

MIKADO MINING COMPANY.—This company has 120 men at work in the mine, which was formerly a portion of the property of the old Argentine Mining Company. About one half of this force are engaged on prospecting work, the other half working on ore. Shipments by the company are being made at the rate of 50 tons per day at present. All of the ore is shipped to the Harrison Reduction Works. The ore shipped is all of oxidized character and siliceous, with enough lead, however, to make it about neutral for smelting. The ore averages of excellent grade, and some of it, carrying silver chloride, is rich.

SMALL HOPES CONSOLIDATED MINING COMPANY.—A diamond drill is being put in place in the Elkins shaft of this company, and it is the intention to sink through the second contact in search of mineral.

### SAN MIGUEL COUNTY.

GOLDEN CHICKEN MINING COMPANY.—The Golden Chicken mine is advertised by the sheriff of San Miguel County for sale with stamps, mine, etc., at public auction on the 12th inst., to satisfy a claim of Charles Painter for $1,203.85.

## DAKOTA.

### LAWRENCE COUNTY.

UNCLE SAM MINING COMPANY.—Active operations began last week, when the Oro Fino pump began draining the workings. The Cornish pump is on the ground, and will be put in position as rapidly as possible. It will not, however, be put at work until the contemplated incline is completed. Two years ago it became apparent that none but a very large pump could keep the mine free from water. The pump then on the property was wholly inadequate, and owing to this fact the mine was finally closed down. At that time sixty stamps were constantly at work crushing ore, and it is stated that the mine was paying.

### PENNINGTON COUNTY.

WEST SALEM GOLD AND SILVER MINING COMPANY.—The secretary writes us: "We have run a tunnel 250 ft., and have rock that runs $13.85 to the ton. We are now building works for ten-stamp mill."

## IDAHO.

### SHOSHONE COUNTY.

A correspondent writes us that the mines of the Cœur d'Alene District are doing well. Among the most important are the Tiger, Poorman, Sierra Nevada, Last Chance and those of the Bunker Hill & Sullivan Company. The first two produce about 25 to 30 tons concentrates per day; the last about 10 to 15 tons.

BUNKER HILL AND SULLIVAN MINING AND CONCENTRATING COMPANY.—The mines have averaged monthly since the beginning of the year from 1000 to 1150 tons monthly concentrates, assaying 68 per cent lead and 29¼ ounces silver. The main operations during the past year have been in a direction toward opening up and developing the mines by new tunnels 300 to 500 feet below the present slopes, with a view of preparing for the erection of the extensive plant on the South Fork River, where the company controls a water right of 500 to 800 horse-power.

## ILLINOIS.

LEHIGH & FRANKLIN COAL COMPANY.—The stock of this company has been decreased from $200,000 to $100,000.

### CHRISTIAN COUNTY.

TAYLORVILLE COAL COMPANY.—It is reported that a vein of coal has been struck at Taylorville by this company at a depth of 460 feet.

### PIATT COUNTY.

The Diamond Drill Company, it is reported, has abandoned the coal prospecting at Monticello after putting down two pipes. The veins were not of sufficient thickness to pay for sinking a shaft. In the boring, however, two artesian mineral wells were struck which bid fair to be very profitable, as the water is pronounced to have valuable medicinal qualities. The city will utilize one of them in its system of waterworks, with pipes running into the city.

## MARYLAND.

### GARRETT COUNTY.

SPRING GARDEN COAL AND COKE COMPANY.—This company has been incorporated, with a capital stock of $250,000, by Frederick A. Thayer, Edward H. Sincell and Waring Thomas, of Garrett County, and Charles H. Barrett and Henry A. Kennedy, of Philadelphia, Pa.

## MASSACHUSETTS.

### BERKSHIRE COUNTY.

Last April, H. D. Ward, of North Adams, discovered in the south part of Adams, called Tophet, outcrops of plumbago. He secured control of a large tract of land covering the deposits, interested three others in the scheme, and began sinking a shaft. At the depth of 20 feet they have uncovered what appears to be a deposit of plumbago.

## MICHIGAN.

### COPPER MINES.

[From our Special Correspondent "Judge."]

HOUGHTON, Oct. 27.

ALLOUEZ MINING COMPANY.—When I was at the Allouez last Friday I took a run down to the stamp mill, which has been recently started up. The mill is about two miles and a quarter from the mine, connection being made by a railroad track, which is now in first class condition. The mill up to about Monday of next week will only be run on part time. After then, however, there will be enough rock supplied to keep the three head of stamps running full-time, the reason for the lack of rock being that the mouth of No. 1 shaft was not quite repaired, but will be ready by about the 29th, and ere this reaches you the mill will be running full-time. A new hoisting plant is being set up at No. 1 shaft, which will probably be ready for active operation by the first of the year. Up to that time the hoisting will be done with power from No. 2 shaft. The mine is looking in very fair condition, particularly at the seventh level, south of No. 1 shaft, and as there is a long stretch of stoping ground at this point the outlook is encouraging. When the stoping ground which ha been opened out is more fully developed, think th

Allouez will show a monthly output of from 140 to 150 tons mineral.

CALUMET & HECLA MINING COMPANY.—I expect to see the largest output from the Calumet & Hecla the present month that the mine has ever made, and should not be surprised to see the month's production reach a total of 3900 or 4000 tons of "mineral." The vertical shaft, which will be known as the Red Jacket shaft, has reached a depth of fifty feet from surface and is now being timbered. At the main mine the water, which, just after the fire has risen to between the 26th and 25th levels, has now been pumped out to the 33d. Just now very little pumping is being done, as the pumps needed some repairs. Below the 33d level little or no stoping has been done, consequently the remaining seven levels contain comparatively little water, and it is now only a matter of a short time when the mine will be dry. The water remaining now in the mine causes no inconvenience, as it is entirely below the stopping ground.

CALUMET & HECLA SMELTING COMPANY. — Smelting work is being pushed along as rapidly as possible, prior to the closing of navigation. Fourteen refining furnaces, one blister furnace and one blast-furnace are being used, the blast-furnace being worked two shifts, each twenty-four hours. Of the refining furnaces, seven are at present being used for ingot, four for wire bars and three for coke. They are now turning out about one hundred and fifty-five tons copper day, and employing in the neighborhood of two hundred and sixty men. A new mineral house is being erected for the convenience of the southerly portion of the works. Before spring a new dock 220 feet long will be built.

KEARSARGE MINING COMPANY.—The output for the present month at the Kearsarge will probably equal last month's produce of 100 tons. The mine is looking very well. The stopes are turning out some first-class rock, with the openings looking very promising.

TAMARACK MINING COMPANY.—The mine is looking well. During the past month No. 2 shaft was sunk 86 feet, being now 1740 feet. Since May 1st, or during the last six months, the work of sinking has been carried on at the rate of 82½ feet per month, or a total of 494 feet sunk in the six months. No. 1 shaft has been sunk to the 10th level, and they are now cutting the plat at that point. Cross-cut at 10th level toward the lode is being driven at the rate of 60 feet per week, and will reach lode about the end of November. A new clerk's office is being erected to stand near No. 1 shaft. A new hoisting plank house is also in the course of construction for No. 2 shaft.

IRON MINES.

BESSEMER CONSOLIDATED IRON COMPANY.—By virtue of an execution issued in the Circuit Court in favor of Gage F. Tarbell, the sheriff sold at public auction, recently, 3581 shares of this company belonging to John E. Burton to E. J. St. Claire for 75 cents a share, the total amount realized being $2721.56.

## MISSOURI.

JASPER COUNTY.

THE BURCH LEAD AND ZINC MINING COMPANY.—This company has been organized in Kansas City, where the main office will be, with a capital of $50,000, to develop the Burch mineral land near Scotland. The tract contains 40 acres in fee simple, and a lease hold on 45 acres. The officers of the company are: A. R. French, President; G. W. Bibbins, Vice-President; J. K. Sellect, Secretary; Powell Jackson, Treasurer, and J. W. Burch, Superintendent and General Manager.

## MONTANA.

SILVER BOW COUNTY.

BOSTON & MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.—This company, it is said, has modified its plans for raising capital to enlarge the borders of the mine and build smelting works. Instead of increasing the capital from 100,000 to 150,000 shares, as officially announced, it is now proposed to add but 25,000 shares, and sell these to shareholders at par, every holder of four Boston & Montana to have one new at 25. It is also proposed to organize a separate company for building smelting works.

## NEVADA.

CHURCHILL COUNTY.

According to reports work has been resumed in the nickel and cobalt mines in the Cottonwood District.

ESMERALDA COUNTY.

The group of mines known as the Palmetto syndicate, situated at Palmetto, are being systematically opened up under the management of Mr. R. B. Catherwood, who has lately assumed control of operations. These mines are owned by a syndicate of New York capitalists. They have recently spent a large amount of money in improvements. A 12-ton mill and all the appliances for lixiviation process, by which the ore will be treated, are now in full working order. The property consists of 18 different mines, all more or less developed and all covered by U. S. patent.

LYON COUNTY.

OEST.—The owners of this mine, near Silver City, have purchased the Comet claim of Messrs. Walker & Pollard (with whom they were in litigation), which gives them 400 feet additional of ground, and also the Comet tunnel. This tunnel will be of great use as it taps the vein at a depth of 225 feet, being within 25 feet of the deepest workings in the bottom of the winze. They paid $4000 for the Comet property. The production of the Oest mine could be greatly increased by opening out more extensively and putting on more men.

STOREY COUNTY—COMSTOCK LODE.

We condense the following from the Virginia City *Chronicle*:

ALTA MINING COMPANY.—The extraction of ore was resumed on the 24th ult., and the mill has started crushing and concentrating it. The ore is taken from the stopes between the 825 and 700 levels and is widening out. Everything about the mine and mill is now in thorough repair. The mill will crush and concentrate 30 tons of ore daily.

BENTON CONSOLIDATED MINING COMPANY.—The indebtedness of the company has been settled and work will be resumed.

EXCHEQUER MINING COMPANY.—At the annual meeting the following officers were elected for the ensuing year: Charles Hirshfield, President; M. Rehfisch, Vice-President; C. E. Elliott, Secretary, and A. C. Hamilton, Superintendent. Mr. Hamilton's report of operations in the mine during the past year contained the following information: "The Alpha shaft was sunk to the 500-foot level during the year, and a drift run east a distance of 100 feet. About 90 feet east of the shaft a body of ore was encountered which was penetrated a distance of about 11 feet. The average assay from the ore was over $30 per ton. We then started a drift north at a point 70 feet in this drift, and extended it a distance of 70 feet, which will be advanced to the Exchequer south line, at which latter point a cross-cut will be started east in the hope of encountering an extension of the ore-body cut in the east drift on the 500 foot level.

JUSTICE MINING COMPANY.—The mill now being constructed is being pushed to completion and will be ready to start this month. The ore now extracted ready for crushing is said to show an average assay value of above $30 per ton, more than 50 per cent of which is gold. There are above 2000 tons of this ore on the dump, and large reserves in the mine stripped ready for extraction.

OCCIDENTAL MINING COMPANY.—During the week ended the 20 ult., there were shipped to the Atlanta mill 150 tons of ore, showing an average assay valve of $28 per ton.

## NEW MEXICO.

GRANT COUNTY.

Dr. H. H. Baker and Mr. McCreary, of Kansas City, have bought the Casson and Fraction mines of W. R. Corbett, who had them under bond. The mines are located at Pinos Altos. Development work will be commenced immediately.

SOCORRO COUNTY.

STONEWALL MINING COMPANY.—This company has just been incorporated. The objects are to develop the Stonewall Jackson lode.

## PENNSYLVANIA.

COAL.

All the coal mines of the Lackawanna region operated by the Delaware, Lackawanna & Western and Delaware & Hudson companies were put on nine hours' time on October 29th, to continue the rest of the year. The mines had been working ten hours per day steady time.

The firms included in the coke producers' combination organized under the name of the Coke Producers' Association are: Reid Bros., Uniondale, 76 ovens; Bliss & Marshall, Kyle, 117 ovens; Percy Mining Company, Percy, 62 ovens; Pennsylvania Manufacturing, Mining and Supply Company, Anchor, 100 ovens; Atlas Coke Company, Atlas, 80 ovens; J. R. Stauffer & Co., Dexter, 40 ovens; J. Newmyer & Co., Cora, 42 ovens; A. C. Overholt & Co., Overton, 110 ovens; B. F. Keister & Co., Clinton, 90 ovens; J. R. Stauffer, Home Works, 20 ovens; Pennsville Coke Company, Pennsville, 92 ovens; Isaac Taylor, Great Bluff, 16 ovens; Wynn Coke Company, Wynn, 70 ovens; J. W. Overholt, Emma, 36 ovens; R. Hogsett, Lemont, 120 ovens, and Mt. Braddock, 123 ovens; A. C. Cochran, 160 ovens; James Cochran Son & Co., Claressa, 108 ovens; Brown & Cochran, Nellie, 250 ovens; J. Cochran & Son, Jackson, 64 ovens; J. W. Moore & Co., Mammoth, 508 ovens; Mutual Mining and Manufacturing Company, Mutual, 142 ovens; Central Connellsville Coke Company, Contral, 204 ovens; in all, 21 firms controlling 2670 ovens. It is probable that one other coke firm will join, and the number of ovens will foot up to nearly 3000. J. W. Moore & Co. will handle and sell all the coke, and after deducting 5 per cent commission turn over the remainder. The advantage of this combination is to enable small producers to take large contracts, say from 12 cars daily up to 50, which at present they are unable to do.

The wages of the coke workers in the Connellsville region were advanced from five to ten per cent on the 1st inst. The McClure Coke Company has posted the following notice on its coke plants in the Connellsville region: "On and after November 1st, 1888, until further notice, the following wages will be paid at the works of this company: Mining and loading room coal, per 100 bushels, 85 cents; cagers, per run, $1.78; drivers, shaft and slope mines, per run, $1.78; drivers, drift mines, $1.70; track-layers, shaft and slope mines, per day, $1.78; track-layers, drift mines, per day, $1.70; trappers, per day, 64 cents; inside laborers, per day, $1.57; coke-drawers, per 100 bushels charged, 51 cents; levelers, per oven, 9 cents; car forkers, per car less than 40,000 pounds capacity, 90 cents; 40,000 pounds capacity and over, $1.05; yard laborers, per day, $1.27." The foregoing is an increase of 6¼ per cent over the present scale of wages. The J. M. Schoonmaker Coke Company has also posted a similar notice on their various works.

J. M. SCHOONMAKER COKE COMPANY.—The immense coke-crusher at the Redstone Coke-Works of this company, near Uniontown, has been started. It has a capacity of about twenty cars per day, and is the invention of Colonel Schoonmaker.

LEHIGH & WIKLES-BARRE COAL COMPANY.—The statement of the operations for eight months ended with August shows:

| | |
|---|---|
| Gross earnings | $6,547,150 |
| Operating expenses | 5,290,127 |
| Net earnings | $1,257,023 |
| Interest and sinking funds | 645,023 |
| Surplus | $612,000 |

PHILADELPHIA & READING RAILROAD COMPANY.—Nearly 300 delegates representing the 25,000 employés of this railroad, in every branch of the service, from all cities and towns along the main line and branches, met at Reading on the 30th ult., to act on President Corbin's scheme to create a relief association for the company's employés. Charles McDonough, of Philadelphia, was chosen chairman, and C. H. Charles, of Philadelphia, secretary. Employés are to pay from 75 cents to $3.75 per month, according to their salaries, and will receive, in case of sickness or disability, from 40 cents to $2.50 per day, according to salary. The plan is to go into operation on January 1st next.

NATURAL GAS.

Prof. E. B. Harden, of the State Geological Survey, expresses the opinion that the efforts of the Standard Oil Company to find natural gas among the Allegheny Mountains and in Eastern Pennsylvania will fail, as the mountains are the result of volcanic eruptions, which would let all gas escape, and the formations in the East are comparatively new. Nevertheless, the Standard goes on prospecting, and the Valley Forge Natural Gas Company has already begun drilling.

EUREKA GAS, FUEL AND LIGHT COMPANY.—This company has been organized for the purpose of making fuel and illuminating gas from oil. A plant is about to be erected at the Johnson Works, Moxham, and if it proves successful will be substituted for natural gas, now in use by the Johnson Company. The new gas was recently tested, with, it is said, success, at Oliver & Roberts' wire mill in Pittsburg.

OHIO VALLEY GAS COMPANY.—This company, which supplies Sewickley, brought in a good well last week at Leetsdale, which insures the company, it is said, a full supply of gas for the coming winter.

## TEXAS.

TEXAS PACIFIC COAL COMPANY.—This company has been organized in St. Louis with a paid-up capital stock of $2,000,000. The company has purchased mines on the Texas Pacific, eighty miles west of Fort Worth, including 23,000 acres of coal land. To this purchase we referred in our issue of October 6th. The coal is of the bituminous variety, and is being supplied to the Texas Pacific Railroad Company at the rate of 300 tons a day. The syndicate claim that the coal equals the celebrated McAllister coal of the Indian Territory. The new company has capital enough in the treasury to increase the output to 3,000 tons a day, of which amount the Texas Pacific has agreed to take between six hundred and seven hundred tons daily. The officers are: Col. R. D. Hunter, of St. Louis, President; E. L. Marston, Treasurer; and Captain Green, of Fort Worth, Secretary. Colonel Hunter is now engaging miners.

## UTAH.

BEAVER COUNTY.

A lease was recently recorded which gives to John Baptista and W. H. Magoffin, of Philadelphia, the right for 99 years to work certain marble quarries located in Pruess District, about twelve miles west of Frisco. The lessees contract to organize a joint stock company, with a capital stock of not less than $250,000, and further that they will commence the development of the property as a marble quarry within eight months from September 28th, 1888; and that within three months thereafter suitable machinery is to be planted at the works for the preparation of the marble for the market.

## WEST VIRGINIA.

BLACK BAND MINING AND MANUFACTURING COMPANY.—This company has been chartered to mine iron ore, coal, etc., manufacture coke, etc., by Edward M. Farnsworth, of Revere, Mass.; F. R. Shattock, Boston, Mass.; A. M. Woodrige and others. The capital stock authorized is $300,000.

WEST VIRGINIA & WYOMING NATURAL GAS COMPANY.—This company has been formed to supply Newport, St. Mary's and other towns with natural gas. The capital stock is $1,000,000; 11,520 acres of land are reported as owned by the company.

# FOREIGN MINING NEWS.

## CANADA.

PROVINCE OF ONTARIO.

A number of new American companies are forming to develop iron ore mining along the line of the Kingston & Pembroke Railway, and it is said that there will be more prospecting done this winter than ever before.

## MEXICO.

ASTURIANA.—This mine, situated in the State of Zacatecas, is a very successful mining investment, and is considered by some as the most important in the State. Its "barras" or parts, of which there are 24, are quoted at $68,000 each. In March, 1887, the mine commenced to pay a dividend of $1000 monthly per "barra" and some months ago this was increased to $2000, at which rate the dividends are now being paid.

[From our Special Correspondent.]

LOWER CALIFORNIA.—A contract has been made by the Government with the Mexicana, a company formed in Europe to buy lands and work mines in Mexico

and which is represented here by Mr. Richard Kent, for the sale of 1,200,000 hectares (2,964,000 acres) of the public lands. The price paid is 21 cents a hectare, or about 8½ cents an acre, which amounts to $252,000, payable in Mexican bonds and in three annual payments of $84,000 each.

The north-eastern part of this territory between the Colorado River and the principal mountain chain, contains deposits of mica, alum, borax, saltpeter and sulphur, which will soon be open to exploitation, as a railroad from Yuma, in the United States, is about to traverse this valley. From the San Antonio mine 45 tons of talc of superior quality have been sent to San Francisco by way of Ensenada. The owner of this mine is Mr. Hugh McCormack.

SONORA.—The Palmarejo Mining Company, of Alamos District, has resolved to spend $1,000,000 to terminate the work of bringing in the water to their mill, for the mill itself and for the construction of a railroad from Palmarejo to Zapote for the transportation of the ore.

A ten-stamp mill is now being erected at the Barranca mine near Los Bronces, of which Mr. Leopold Graff is General Manager. This is said to be one of the richest silver mines in the State.

The Omega Mining Company has some mines about 80 miles southwest of Nogales in the Basochuca Mountains. A forty-ton smelting-furnace has been ordered, and about 150 men are at work building roads, mining, etc. The ores are of gold, silver, lead, and iron. J. M. Cummings is the Superintendent.

The San Marcial mine, forty miles west of Santa Ana, is owned by John Marshall, of Cleveland, Ohio. The ledge is said to run from 12 to 24 inches in thickness of free milling ore with three ounces of gold per ton.

The Leandrana gold mine, twenty-five miles southwest of Nogales, has made a new strike, out of which some ores have been taken that assay over $27,000 in gold per ton. The average assays of the mine are said to give $1150 per ton.

A corporation called the Franco-German Colonization Company has bought a large tract of public lands in this State, and has also received four mining concessions, of which one includes the Omega mine, above referred to. Another of these concessions is in the Nacosari country, and includes the Piñitos mine, owned by the present Governor; the San Pedro, owned by a New Jersey company; the San Pablo, owned by Tombstone people; the Grand Republic, owned by Freaner & Wheeler; the Churumibabo, owned by U. S. Surgeon Brown, and the Guaja and Piña, owned by Mr. Casimiro Streeter. The rights of these parties will, of course, not be affected by the concession, which will only operate to put an end to outside prospecting until after the owners of the concession have selected the claims that they propose to work.

A concession has been granted by the government to Carlos Eisenmann and Louis Lejeune to explore for and work mines of all kinds and gold placers in the district of Ures. The concession covers a square of thirty kilometers on each side in the valley of the San Miguel River.

CHIHUAHUA.—The newly discovered gold mines of San Gabriel and La Gloria, near Batopilas, are still in big bonanza. The owners have lately made a contract with American parties who are to put up a mill of from 80 to 100 stamps within a year in some suitable place, as near as possible to the mines. The owners are under contract to deliver to the mill all the ores that come out of the two mines during fifteen years, and are to pay for the amalgamation thereof at the rate of $4.50 per ton.

In the Carrizo mining district the Hazel Mining Company has a force of 65 men working day and night. Two steam hoisters are busy, day and night, on the shafts that are being sunk. One shaft is down 210 feet, another 280 feet and a third 60 feet. Jacob Hand has shipped several carloads of silver ore and Joseph Beach some silver bearing copper ores and a carload of iron ores to El Paso.

In the Sabinal camp the Plancha de Plata is reported as shut down and with a lawsuit on hand for wages due. The rest of the properties in the camp are reported, with one or two exceptions, to be doing well.

In Pinos Altos the Atlantic mine, owned by Peter Wagner, is running night and day, both mine and mill, on $55 ore. The Golden Giant mine, in the same camp, owned by Daniel Coomer, is also worked by day and night shifts, producing $40 ore, which is worked in the Bell Stevens mill.

A concession has been made to Jose Valenzuela to explore for and work mines of all kinds at San Juan, canton of Mina. It covers a parallelogram of 20 by 30 kilometers.

SINALOA.—Antonio B. Gastelum has received a concession to work mines of all kinds at Realito, district of Fuerte, within a parallelogram of 20 by 30 kilometers. D. de Saracho has received a concession of the same size at Coix in the same district.

COAHUILA.—Within the past few weeks a bed of black sand has been discovered about five miles north of Santa Rosa, which is described as similar to the "black sand of Colorado" (sand carbonates probably), which is claimed to be in apparently inexhaustible quantity, and to carry 15 to 20 ounces of silver to the ton. Kansas City and St. Louis parties are already negotiating for the property it is said.

At the Cedral mines the coal bed is being worked to the temporary exclusion of the silver mine. The work in these, as well as in the other silver mines of the State, is rather hindered from a scarcity of miners. The latter have been attracted to the coal mines at San Felipe, some fifty miles away from Santa Rosa, by higher wages.

The output of the San Felipe coal mines is now averaging 400 tons daily, all that the railroad can transport with its present facilities.

The International Railroad Company has at last arranged all difficulties about its concession, and will build a branch from Monclova, through Cuatro Cienegas, to the Sierra Mojada. This branch will first pass near the lead mines at San Pablo and the silver mines of San Marcos, all of which are idle at present because the ores are too low-grade to bear wagoning, and then through an almost unknown stretch of desert, rich in mineral possibilities, before getting to the Sierra Mojada. Cuatro Cienegas, I may remark, is a great grape growing town, where they make the best native wine in the Republic.

Feliciano Zermeño and Manuel Rosas have received a concession to explore for and work mines of all kinds and gold placers in the Sierra del Carmen, district of Monclova.

DURANGO.—The Freeman M. & M. Co. are placing a twenty-stamp mill at their mine near San Jose de Calvo.

SAN LUIS POTOSI.—The contracts have been awarded for the construction of a branch from the station at Vanegas, on the Mexican National R.R. to Cedral and possibly to Matehuala. Cedral is the point where the ores from the rich mining camp at Catorce are brought to be worked by amalgamation or by smelting, as the case may be. Matehuala is a mining town some 12 miles beyond to the southward. The branch will be about thirty miles long if extended to the latter place and is sure to do well, as the mining interests along it are only waiting cheap transportation to start into vigorous life.

The miners of these districts complain, however, that there have been many propositions made to them for the purchase of their ores by the agents of several American companies, but that not one purchaser has really done any buying. Probably the buyers are waiting until the question of transportation can be more definitely settled.

The Concepcion mine in Catorce has paid a first dividend, and there is every reason to believe that this satisfactory state of things will continue.

NUEVO LEON.—Prof. Chas. E. Hall, of Philadelphia, has recently been visiting mines near Monterey, Villaldama, Ceralvo and Candela. He was sent out by some Philadelphia parties who contemplate investing in that part of Mexico.

A strike of ore, which runs in some cases as high as $500 per ton, is reported from the Rosario mine at Salinas Hidalgo.

Very few American miners are at work in the mines of this State, as they do not care to come to Mexico to work and the few that do come do not stay long.

COLIMA.—Some time ago I reported an official communication from the Governor of this State, which affirmed that there were no mines within its boundaries. I an informed that since then a bed of a superior quality of coal has been sound in a latitude the farthest south that this mineral has been met with in North America.

JALISCO.—The Providencia mine in Autlan is said to have yielded six tons of ore during the month of August worth $24,600 per ton. The number of workmen employed is 25, earning 37 to 62c. a day, and the capital invested in the mine is estimated at $22,000.

HIDALGO.—In Pachuca, the Espiritu Santo mine suffered considerably on account of the water in the shaft having covered up all the producing stopes.

In the Santa Elena Almoloya a party of English miners took up the mine after it had been abandoned by some poor Mexicans who had exhausted their funds and patience in endeavoring to reach the lode with a tunnel. The Englishmen sunk a winze twelve feet deep at the end of the tunnel, and struck a vein half a yard wide with ore that assays up to $2000 per ton. The vein is being followed downward, and is said to be widening.

Over 800 cargas of good ore were taken out of the San Cayetano el Bordo mine in one week lately. The production still continues at about this rate and the mine is considered in bonanza.

In the Guadelupe hacienda a vein of silver ore, half a yard wide, was struck at the depth of one hundred yards in sinking a well for water.

In the Santa Gertrudis mine the extraction is said te be larger and the ore to be growing richer as they go down. It is expected that it will pay three dividends this month, amounting to $57,600 on the whole stock. The stock is sold at prices which make the whole mine worth about $1,500,000.

The Cueva Santa mine is sending out some moderately good ore, but the exploration is still being carried on with a view to completely developing the ore-body before commencing to stope out any quantity.

MICHOACAN.—The Concepcion mine in Tlalpujahua has at last made a connection between the shaft and the lowest working level of the mine, and has commenced to utilize its hoisting machinery for the extraction of the ore. The whole twenty stamps are at work in the mill, which will be enlarged in a short time.

TAMAULIPAS.—It is reported that mines of silver and quicksilver have been discovered near Victoria, the capital of this State, in the mountain west of the city. An old silver mine at Llera, abandoned many years ago on account of the revolutions, has been reopened by some Americans.

GUERRERO.—The Garduño Mining Company, composed of some substantial men of this city, owns an extensive mining zone near Puerta del Oro in Guerrero. The veins in the mines are of quartz and well defined. Most of them carry pyrites containing gold, but there is one with free gold. The low-grade ores are said to assay 27 ounces of gold and 15 ounces of silver per ton, and the selected ore as high as 90 ounces of gold and 25 ounces of silver. About 300 tons of ore are said to have been already mined and the company is putting up a complete mill to be run by a fine water-power near by. The work has been done hitherto only by hand or mule power. At San Cristobal there is a mine owned by a New Orleans company, which produces little gold and considerable silver.

CITY OF MEXICO, Oct. 24, 1888.

## SPAIN.

RIO TINTO COMPANY, LIMITED.—The company has issued the following brief interim report, dated October 16th, upon the current year's business of the company, as is usual at this season: "On the occasion of meeting you in May, your directors reported to you the contract which they had effected for the sale during three years of the previously unsold balance of the copper produced at the mines, and that upon such terms as would ensure a marked improvement in the earnings of the company. Your directors are to-day able to add that the estimates under this head are being amply realized, also that the production of copper at the mines comes up to the estimated quantity. The deliveries of pyrites under the new contracts (for 1888, 1889 and 1890) promise to attain during the present year the already announced estimate of 400,000 tons. The copper contained in the pyrites is not included in the contract for the sale of that produced at the mine, yet reaps the benefit of the rise in the market value of this metal. Your directors have now to declare an interim dividend, on account of the year's profits, of 20s. per share, free of income tax, payable on the 17th November next."

# COAL TRADE REVIEW.

NEW YORK, Friday Evening, Nov. 2.

## Statistics.

**Production of Anthracite Coal** for week ended October 27th and year from January 1st:

| | 1888. | | 1887. |
|---|---|---|---|
| Tons of 2240 lbs. | Week. | Year. | Year. |
| P. & Read. R.R. Co. | 208,450 | 5,774,935 | 6,078,580 |
| Cent. R.R. of N. J. | 147,656 | 4,676,671 | 4,020,084 |
| L. V. R.R. Co. | 180,000 | 5,494,443 | 5,189,453 |
| D., L. & W. RR. Co. | 172,399 | 5,712,405 | 4,744,267 |
| D. & H. Canal Co. | 100,861 | 3,664,907 | 3,169,866 |
| Penna. R.R. | 58,431 | 3,713,989 | 2,953,590 |
| Penna Coal Co. | 34,210 | 1,398,754 | 1,263,718 |
| N. Y., L. E. & W. | 25,000 | 795,551 | 627,514 |
| Total | 927,007 | 31,231,655 | 28,047,072 |
| Increase | | 3,184,583 | |

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Production for corresponding period:

| | | | |
|---|---|---|---|
| 1883 | 26,640,470 | 1885 | 25,316,081 |
| 1884 | 25,617,681 | 1886 | 26,062,862 |

**Production of Bituminous Coal** for week ended October 27th, and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

| | 1888. | | 1887. |
|---|---|---|---|
| Tons of 2240 lbs. | Week. | Year. | Year. |
| Phila. & Erie R.R. | 1,296 | 52,594 | 16,121 |
| Cumberland, Md. | 78,866 | 2,946,815 | 2,649,299 |
| Barclay, Pa. | 4,500 | 136,691 | 149,498 |
| Broad Top, Pa. | 9,880 | 294,058 | 278,826 |
| Clearfield, Pa. | 65,145 | 2,755,290 | 2,601,260 |
| Alleghany, Pa. | 15,730 | 643,459 | 695,957 |
| Pocahontas Flat Top | 23,449 | 1,131,889 | 828,782 |
| Kanawha, W. Va. | 32,357 | 1,314,028 | 1,142,216 |
| Total | 230,223 | 9,274,824 | 8,361,939 |

WESTERN SHIPMENTS.

| | | | |
|---|---|---|---|
| Pittsburg, Pa. | 17,483 | 596,627 | 456,450 |
| Westmoreland, Pa. | 34,401 | 1,262,473 | 1,151,334 |
| Monongahela, Pa. | 8,008 | 329,929 | 310,633 |
| Total | 59,892 | 2,189,029 | 1,918,917 |
| Grand total | 290,115 | 11,463,853 | 10,280,856 |

**Production of Coke** on line of Pennsylvania R.R. for week ending October 27th, and year from January 1st, in tons of 2000 lbs.: Week, 91,104 tons; year, 3,269,884 tons; to corresponding date in 1887, 2,952,410 tons.

## Anthracite.

The business in anthracite continues to be large, but it is mostly on old orders. New business is rather scarce, and some of the sizes are commencing to weaken perceptibly in price among the outside dealers. Nevertheless, the market is fully as good, if not better, than might have been expected at this season of the year, after such a boom as it has had for months past. There is every prospect of the trade continuing to take all the coal that is brought forward up to the close of navigation, after which a curtailment of output will have to be made, or stocks will accumulate.

We continue our prices of last week, noting only that the weakness which has characterized the steam sizes has now extended to chestnut coal. Stove coal is now the only size that is absolutely up to par in the market.

We quote f.o.b. prices at New York shipping ports as follows:

| | | | |
|---|---|---|---|
| Broken | $3.95 | Chestnut | $4.65 |
| Egg | 4.30 | Pea | $2@$2.25 |
| Stove | 4.65 | | |

Elsewhere we call attention to the petition made by Messrs. Coxe Brothers & Co. to the Inter-State Commerce Commission. The subject is a very interesting one to the trade, and we shall take pains to keep our readers informed of its progress.

## Bituminous.

The bituminous trade is very active, and the standard coals are selling at full prices, and are in demand exceeding the ability to deliver.

There is nothing new in the arrangements for next year. It is, of course, hoped that they will materialize

and that when they are made they will be better observed than this year. No doubt the question will be discussed for some months yet, and in due time (the heaviest contracts being mostly taken), the new arrangements will be announced as in past years.

We continue our prices, which are fully maintained in current business: $2.60 f.o.b. Baltimore and Georgetown, and $3.25 for New York Harbor.

**Boston.** Nov. 1.

[From our Special Correspondent.]

The demand for anthracite coal is moderate at this port. It would be good if there were coal enough for quick shipment, but the same causes continue to curtail business which have been noted for weeks past. It may seem peculiar to say in this connection that the tendency is towards lower prices, but such is the fact. Only coal for immediate shipment is firmly held; coal for future delivery, where it can be had at all, is weak, especially broken and egg, and nut coal is not so firm as it has been. This has been the tendency of the market for some time, and the indications as viewed from this port are that f.o.b. quotations of anthracite coal of all kinds will be easier still. The pressing inquiry for stove coal is sufficient to keep that branch of the market in sellers' favor.

The question as to whether the bituminous coal pool will be continued another year is creating some interest, following upon the recent meeting in New York. The harmony there manifested is considered of no consequence whatever. A little later it will appear whether anything is to be attempted or not. Of course, every one knows that the pool has been a farce this year, so far as the great bulk of the business is concerned. There is a light movement in the trade now, and business on new orders will continue to decrease. The high freights are causing uneasiness in some quarters and will curtail profits, particularly if they remain at the ruling figures of this week. It is hard to buy any Cumberland coal under $2.60 f.o.b., but good bituminous coal can be had as low as $2.45 f.o.b.

The tone of freights is very firm, and many think there will be no material reaction.

We quote vessel rates, exclusive of discharging: New York, $1.15@$1.20; Philadelphia, $1.25@$1.35; Baltimore, $1.50@$1.60; Newport News and Norfolk, $1.50; Richmond, $1.70; Provincial, $1.75@$2.

The retail movement is very good, and prices are firmly held.

Delivered prices are: Stove and Nut, $6.50; Egg, $6.25; Broken, $6; Franklin, all sizes, $7.75; Lehigh Egg, $6.50; Broken, $6.25. Wharf prices 50 cents less than the above. Bituminous coal, $4.25 on the wharf.

**Buffalo.** Nov. 1.

[From our Special Correspondent.]

The anthracite coal trade quiet, and the month opens without any change in quotations. It will be seen from the annexed statistics that the shipments by lake thus far this season are about two millions and a quarter net tons, an excess over corresponding period in 1887 of about five hundred and eighty seven thousand tons. There is another month of navigation yet to be reported, which will probably add another quarter million to freight shipments.

Dealers and shippers have nothing to say about the present and future condition of the hard coal trade, simply remarking that everything connected therewith is satisfactory.

Bituminous coal firm, and indications are that an advance in quotations will soon take place. All varieties are very scarce and wanted. Complaints of lack of transportation facilities by rail still exists, and great inconvenience and much annoyance prevails among receivers and shippers.

Coke quite and quoted at $3.25 for Reynoldsville, and $4 for Connelisville per 2,000 pounds on cars.

Relative to lake freights, the demand for vessels principally for Chicago and Milwaukee. Many boats wanted cargoes for Lake Superior ports, but as they could not be obtained, left light for Cleveland, Erie and other places. Toledo quotations advanced 10c. per ton. The ruling figures were as follows: $1 to Chicago, $1.10 to Racine, 90c. to Milwaukee, 75c. to Port Arthur, 60c. to Duluth, Gladstone and Superior; 40c. to Detroit, 40@50c. to Toledo, 75c. to Green Bay, 50c. to Osceola, 50c. to Bay City, and 90c. to Menominee. Closing quiet and firm. Weather clear, bright and warm.

The shipments by lake westward from this port from October 25th to 31st, both days inclusive, were 73 770 net tons, namely 36,000 to Chicago, 14,980 to Milwaukee, 7600 to Duluth, 6650 to Superior, 2950 to Toledo, 1190 to Racine, 3100 to Gladstone, 800 to Green Bay, 150 to Bay City, and 350 to Osceola. The total shipments thus far this season 2,244,800 net tons, including cargoes on vessels from Tonawanda not reported at the Buffalo Custom House.

The receipt here of coal by canal for fourth week in October, 3917 net tons; shipments, none.

The following statistics are of interest: Receipts of coal by lake at Buffalo this year none. The shipments westward by lake for the month of October, 411,600 net tons, as compared with 275,750 tons in 1887, and 218,470 tons in 1886; for the season to November 1st, 2,244,800 net tons, 1,657,830 tons in 1887, and 1,347,340 tons in 1886. The receipts by canal for October, 17,687 net tons, as compared with 9048 tons in 1887; the shipments, 3917 net tons as compared with 1439 tons in 1887; the season's receipts to November 1st, 123,963 net tons, as compared with 55,978 tons in 1887, and 72,666 tons in 1886; the season's shipments to November 1st, 10,029 net tons, as compared with 8141 tons in 1887, and 17,572 tons in 1886. The railroad receipts and shipments not reported, as the companies decline to give the information.

This year the closing rate of lake freights on coal hence to Chicago $1, the same as in 1887 and in 1886.

The distribution of coal from this port by lake since opening of navigation to November 1st was as follows, to points named:

| To | Net tons. | To | Net tons. |
|---|---|---|---|
| Chicago | 849,139 | Manistee | 600 |
| Milwaukee | 501,967 | Marquette | 20,580 |
| Duluth | 252,440 | Romney | 317 |
| Sandusky | 6,930 | Manitowoc | 8,230 |
| Racine | 28,280 | Escanaba | 1,700 |
| Toledo | 72,942 | Alpena | 1,620 |
| Bay City | 9,210 | Marine City | 2,100 |
| Pt. Colborne | 950 | Hancock | 1,570 |
| Windsor | 2,320 | Michigan City | 600 |
| Cleveland | 1,030 | Bay Mills | 300 |
| Detroit | 31,350 | Put-in-Bay | 350 |
| Ludington‡ | 1,530 | Kenosha | 630 |
| Gladstone | 29,690 | Muskegon | 1,470 |
| Washburn | 29,170 | Sault Ste. Marie | 3,150 |
| Houghton | 630 | Sheboygan | 11,120 |
| Lake Linden | 5,660 | Kenosha | 4,800 |
| Ashland | 34,560 | Pt. Arthur | 3,366 |
| Green Bay | 27,120 | Wallaceburg‡ | 280 |
| Saginaw | 15,215 | St. Clair | 1,000 |
| Superior | 113,050 | Portage | 620 |
| Marinette | 3,730 | Pt. Clinton | 970 |
| Tawas | 250 | Kincardine | 3,290 |
| Cheboygan | 1,040 | Pt. Huron | 3,490 |
| Kelly Island | 870 | Miscell. points per Tonawanda vessels, about | 175,000 |
| Oscoda | 350 | | |
| Menominee | 2,640 | | |
| St. Ignace | 500 | | |

(Subject to correction.)

**Pittsburg.** Nov. 1.

[From our Special Correspondent.]

*Coal.*—The stage of water in the Ohio during the week has been ample. Most of the coal mined has been sent to the lower markets, which at the present time are overstocked, causing a further decline in prices. The advance of five cents per ton in railroad mining went into effect on the first of November. Of course the miners are happy.

Prices in the pools are:

PRICE OF COAL PER 100 BUSHELS = 7600 LBS.

| | | | |
|---|---|---|---|
| First pool | $4.75 | Fourth pool | $3.25 |
| Second pool | 4.25 | Railroad coal | 5.00 |
| Third pool | 3.75 | | |

*Connellsville Coke.*—Idle ovens in this region are rapidly disappearing and dollar coke is a thing of the past. The week finds but 1502 idle ovens, against 4300 a few months ago. Week's shipments show 6020 cars; previous week, 5975; increase, 1045 cars. There is still a scarcity of cars, the Lake Erie system continue to furnish the best quota, the Baltimore and Ohio and Pennsylvania the worst. The car agents are doing the best they can under the circumstances, and complaints are in consequence scarcer.

The new rates are: Blast-Furnace, $1.25 per ton; to dealers, $1.35; foundries, $1.40.

*Freight rates* to Pittsburg, 70c. per ton: to the Mahanoy and Shenango valleys, $1.35; East St. Louis, $3.20; to Cleveland, $2.80; to Chicago, $2.75; to all other points the same proportions.

## FREIGHTS.

The latest charters to November 2d per ton of 2240 lbs.

**From New York to:**—Bath, $1.15*; Beverly, $1.15*; Bridgeport, Conn., .70; Cambridge, Mass., $1.10* 3c.; Cambridgeport, $1.10*3c.; Charlestown, $1.10; Chelsea, $1.10; Com. Pt., Mass., $1.10; E. Cambridge, $1.10*3c.; E. Greenwich, R. I., .85@.90; Fall River, .75@.90; New Bedford, .80@$1; Newburyport, $1.25*; New Haven, .70; Newport, .85@.90; New London, .80@.85; Norwalk, Conn., .70; Norwich, .90; Portland, $1.10*; Portsmouth, N. H., $1.20*; Providence, .80@.90; Salem, $1.15*.

**From Baltimore to:**—Bangor, Me., 1.60; Bath, 1.60; Boston, 1.50; Bridgeport, Conn., 1.35@1.40; Bristol, 1.25@1.30; Brooklyn, 1.15; Charleston, 1.15; Fall River, 1.40; Galveston, 2.90@3.00; Gardner, Me., 1.75; New Bedford, 1.35; Newburyport, 1.50; New Haven, 1.35; New London, 1.35; New York, 1.15; Portland, 1.50; Portsmouth, N. H., 1.60; Providence, 1.35@1.40; Quincy Point, 1.50; Richmond, Va., .70; Roxbury, 1.50, 3c.; Salem, Mass., 1.50; Savannah, 1.15; Somerset, 1.35; Williamsburgh, N. Y., 1.15@1.25; Wilmington, 1.00.

**From Philadelphia to:**—Bangor, 2.00*; Boston, 1.50@1.60*; Com. Point, Mass., 1.42½*; Fall River, 1.15@1.25*; Gardner, Me., 1.60*; Georgetown, D. C., .85; Lynn, 1.75@1.85*; New Bedford, 1.15@1.25*; Newburyport, 1.75*; New York, .90†; Norfolk, .70; Portland, 1.50@1.60*; Portsmouth, N. H., 1.60*; Portsmouth, Va., .65; Providence, 1.15@1.25*; Richmond, Va., .75; Rockport, 1.22½*; Saco, Me., 1.75*; Salem, Mass., .90*; Savannah, 1.00; Washington, .85; Weymouth, 1.15*; Wilmington, N. C., .60.

* And discharging. 3c. per bridge extra. † Alongside. ‡ And towing.

## METAL MARKETS.

NEW YORK, Friday Evening, Nov. 2.

**Prices of silver per ounce troy.**

| Oct. | Sterling Exch'ge. | Lond'n Pence. | N. Y. Cts. | Oct. and Nov | Sterling Exch'ge. | Lond'n Pence. | N. Y. Cts. |
|---|---|---|---|---|---|---|---|
| 27 | 4.87¼ | 43⅛ | 94 | 31 | 4.87¼ | 43 | 93¾ |
| 29 | 4.87¼ | 43⅛ | 94 | 1 | 4.87¼ | 43 | 93¾ |
| 30 | 4.87¼ | 43 | 93¾ | 2 | 4.87¼ | 43 | 93¾ |

*Foreign Bank Statements.*—Thursday being a holiday in London, there was no meeting of the Bank of England governors, and the rate of discount remains unchanged at 5 per cent. The weekly statement, however, was issued, showing a bullion loss of £144,000, and the proportion of its reserve to its liabilities was reduced from 38·38 to 37 94, against an advance from 45·47 to 45·56 in the same week of last year. Thursday the bank lost £394,000 bullion on balance.

**Copper.**—This market continues firm and quiet, and apart from the operations of the French syndicate very little business is taking place. Some parcels of Spot Lake Copper were sold in the Metal Exchange during the week at 17·65. Casting Copper is held for 16⅛ to ⅜.

Rumors continue in circulation that negotiations are still going on between the syndicate and the producing companies to extend the existing contracts for a further term, but so far nothing definite has transpired regarding this important matter. The European markets are very firm and business active. Chili Bars are steady at £78 for Spot, and £78 10s. for three months. G. M. B. Copper is quoted $77 10s. for cash, and $78 to $78 5s. for three months; Tough Copper, £80, and Best Selected, £81, and a good business is reported in all sorts.

PROPOSED CONVERSION OF THE COPPER SYNDICATE.—It is reported that M. Secretan is expected in London shortly for the purpose of taking the necessary steps to turn his copper syndicate into an English company under the Limited Liability Acts. It is given out that Messrs. Barings are behind the enterprise, and the support of the Rio Tinto group and the members of the existing syndicate is assured. The title of the new company has not been decided upon, but it will not include the word "copper" in any form. It will have for its objects the "cornering" of products generally, as opportunities may arise—in fact, a sort of international "cornering" syndicate.

**Tin** has been rather neglected during the week, and business in this metal has been very quiet. Quotations are rather lower than last week, and we now quote spot, 23; November, 23; December, 23.

The London market has also been dull, and prices have given way there, but close firmer at £101 10s. spot and £102 three months, being a recovery of 10s. from lowest point.

**Lead.**—Almost the whole attention of the trade continues to be concentrated in the movements in this market, and very large transactions have again taken place during the past week. At the beginning of the week prices dropped down to 3⅝, and at that figure a few small lots were disposed of. Strong buying then set in on the part of consumers, who took up very large quantities, and this awakened the speculators who, however, did not secure much, as they had been holding back in the hope of being able to get in at a still lower level. The market continues very firm at the close to-day at the following quotations: Spot, 3·80; November, 3·82½; December, 3·85; January, 3·85.

*Chicago, Ill.*—Messrs. Everett & Post telegraph us to-day as follows: The market is firm, with large inquiry. Aggregate sales of two thousand tons at 3·80@3·75c. are reported. Consumers are taking hold.

**Spelter** remains firm but quiet. We quote prime Western 5·20 to 5·37½. The London market is firm and higher. Good ordinary brand £18 17s. 6d.@£19. Specials, £19 2s. 6d.@£19 5s., which is about 5⅛, duty paid, New York.

**Antimony** is also very firm at 14c. for Cookson's and 10½ for Hallett's. In England the quotation for Hallett's stands at £43, which is above the parity of this market.

## CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Nov. 2.

**Heavy Chemicals.**—This market is substantially the same as at our last review. Naturally on the eve of a Presidential election there is a diminution of the volume of business and a decrease in the activity of the market. During the week we have been unable to learn of any large transactions, trade being confined entirely to small sales for immediate and pressing requirements. The tone of the market, however, is firm, and stocks being light, there is a feeling prevailing among the trade, on this side at least, that the coming year will be of increased activity and advanced prices. There has been no important news from Liverpool, save the reassurance of the fact that the "combinations" are working smoothly; that supplies are scarce, and that prices are generally firm. There is very little offering in either in New York or in Liverpool below current quotations.

Carbonated Soda Ash, 48 per cent.—Liverpool brands are quiet. Consumers seem to invariably prefer to delay purchases "till after election," and this is applicable not only to soda ash but to most heavy chemicals. Supplies on the spot, however, are scarce and, ocean freights continuing high, prices are well maintained. The usual quotations are 1·25@1·30c. for both spot and arrivals.

Newcastle soda ash has been lightly dealt in, at about 1·25@1·30c. on the spot, according to quantity, and 1·22½@1·27½c. to arrive and for shipment.

Caustic soda ash, 48 per cent, has been sold in a jobbing way, very little demand being apparent. In sympathy with the general tone of the market prices are firmly maintained. Ruling prices are 1·27½@1·30c. on the spot, and 1·25@1·30c., according to brand, for arrivals.

Caustic Soda.—There have been no further reports from abroad, and the situation of this article is practically unchanged. Supplies are rather scarce, but in the absence of any urgent demand there has been no material change in prices, which remain as follows: 60 per cent, 2·55@2 60c., and 70@76 per cent, 2·35@2·40c.

Sal soda is neglected by buyers to such an extent that the scarcity of spot stock is not felt. The usual

quotations on the spot are ·95@1c., while to arrive may be had at ·95c.

Bleaching Powder.—The market is perhaps a shade easier, owing to recent arrivals, but there is still a scarcity of available stock that sustains prices and reduces the offerings. The demand this week, however, has not been pressing, and quotations are consequently easier at 2·25c. on the spot, and 2·12½c. to arrive.

**Acids.**—A good, steady demand for nitric, muriatic and sulphuric acids has characterized the market this week. Considerable business has been done and manufacturers report uniformly light stocks and firm prices.

There is no special demand for acetic acid, and values are largely nominal. The usual asking price is 2¼@2½c., although large quanties could probably be obtained at 2c.

Nitrate Acid.—The improved demand and general activity in business warrants an advance in prices, which, as revised, are as follows: 36°, 4@5c.; 38°, 5@5½c.; 40°, 6c.

Muriatic acid is quiet but firm, at the following figures: 18°, 1·20c.; 20°, 1 30@1·50c.; 22°, 1·40@1·80c.

Oxalic Acid.—The market is without particular animation, the old prices being well maintained and business generally steady and fair. We continue to quote 8½c. per lb. for 10-ton lots, and 9c. per lb. by single cask.

Tartaric acid is quiet at unchanged figures. The quotations, which are unchanged, are as follows: 43c. for crystals, in quantities of 3000 lbs. or more; in bbls., less quantity, 44c.; in 50-lb. boxes, 45c. For powdered, advance these prices one cent.

Sulphuric Acid.—Although sales during the week have not been large, a fair business has been done, and prices are very firm, owing to the very light stocks in the hands of manufacturers. Quotations, which are gradually stiffening, are for 66 degrees, ·95@1·25c., according to quantity, and ·90@·95c. for 60 degrees.

**Fertilizers, etc.**—The improved demand for chemical fertilizers noted for some time past continues with no apparent abatement; prices are therefore well sustained and considerable business is being done. The revised price list is about as follows: Azotine, $2.50@$2.55 as to quality; dried blood (city), low grade, $2.45@$2.55 per unit; Western high grade, $2.50@$2.60 per unit for ground material; tankage, high grade, $23@$25 per ton; low grade, $21@$22 per ton as to quality. Fish scrap, $24@$25 per ton f.o.b. factory. Sulphate of ammonia, $3.35 per cwt.

Refuse bone-black, guaranteed 70 per cent phosphate, is quoted at $19.00@$19.50 per ton. Dissolved bone-black is 90c.@$1 per unit for available phosphoric acid, and acid phosphate 75@80c. per unit for available phosphoric acid.

Steamed bones, unground, $19; ground, $25@$26.

Charleston rock, undried, $5@$5.25 per ton; kiln dried, $6 per ton, both f.o.b. vessels at the mines. Charleston rock, ground, is held at $10@$10.50 ex steamer at New York.

Muriate of potash is not in plentiful supply. The usual prices are $1.80@$1.85 for both spot and arrivals.

Double Manure Salts.—Transactions have not been at all large, and prices are nominal at 1·15@1·20c. on a basis of 48 per cent potash.

High grade sulphate of potash is firm at $2.30 per cwt., basis of 90 per cent.

Kainit.—There is nothing to be had on the spot, and as everything afloat is sold for consumption, there is very little obtainable, even in the way of resales. The market is entirely under the control of the German syndicate, and as ocean freights continue high, there seems to be little prospect of any lower prices for some time to come.

Brimstone.—Prices are slightly easier. Transactions have not been large. We quote $23.00 for best unmixed seconds on the spot, or to arrive near by, $20 for later arrivals, and $19.50 for shipment.

Nitrate of soda is quiet but firm at previous prices, which are easily upheld. Asking prices are 2·22½c. on the spot, and 2·17½@2·20c. to arrive.

Acetate of lime is weaker, owing to the falling off in the demand. Quotations are in the neighborhood of 1·10c. for Brown and 2·12½c. for Gray.

Cream of tartar is without feature of interest. The demand is moderate and prices are unchanged from those quoted last week.

Arsenic is firm and unchanged in price.

**Minerals.**—Business has been steady and quiet, with no important change in quotations.

China clay is in very plentiful supply, against which there is not a great demand. Jobbing sales are reported at $16@$18 for the better grades, and $13.50 for poorer qualities.

Sulphate of barytes is in improved demand. Previous quotations rule.

See our "Current Prices" for quotations.

## BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, Nov. 2.

*Bricks.*—There has been a plentiful supply on the market during the week, but a steady and considerable improvement in the demand has pretty well absorbed available stock, so that to-day the over supply is less apparent. There has been a gradual stiffening in quotations, especially for the better grades, and upon revision of prices, up river brick is advanced 12½@25c. per M. Pales are neglected.

*Lime.*—Arrivals from the East have been light, and prices are well sustained at association rates. The demand has been only moderate and quite readily supplied.

*Cement.*—Importers seem to find an outlet for the large quantities of Portland cement constantly arriving, as few complaints are heard and prices are well upheld. Domestic cement is moving freely. Sellers seem to find little difficulty in obtaining full prices.

*Roofing Slates.*—The excellent demand noticed in previous issues continues.

For latest prices of building materials and wages of laborers see our current prices.

## IRON MARKET REVIEW.

NEW YORK, Friday Evening, Nov. 2.

The iron trade continues on, like every other class of business this year, quite unruffled by the election. Every one remarks that never before in twenty years have business men felt calmer or less disturbed by an election, and since many seem to consider the result doubtful, the explanation of the general feeling is that there is entire confidence in the future whoever may be elected President.

The only questions which affect trade are the cost of production, which in pig iron, and consequently also the higher forms of iron, is increasing, owing to higher priced coke and ore.

*American Pig.*—The market here is unchanged and is somewhat dull and listless, the consumption in this immediate vicinity being perhaps a little less than at the corresponding season last year. Prices remain unchanged, however, and the general impression is that the demand will increase as the season advances.

*Scotch Pig.*—This article is a shade firmer and the prices remain unchanged. Importations, of late, having proved unremunerative, have fallen off, and this accounts for the improved tone in the market. We continue our quotations in our usual table of "Current Prices" on another page.

*Bessemer Pig.*—There is nothing new in this, prices here being below the standard for importation and no prospect of a change which would admit the foreign article. We continue our regular quotations, which, however, are purely nominal.

*Steel Rails.*—There have been several large contracts for steel rails closed during the week. The New York Central has purchased 13,000 tons and the Lake Shore 8000, part of the order going to a Scranton mill and part of it to a new Pittsburg concern. The price has not been mentioned, but it is understood to be extremely low, some of the mills say unnecessarily low. We also hear of an order having been placed for 4000 tons for one of the Cincinnati roads, and there are several inquiries in the market which would add up to probably 50,000 tons. The prices asked at Eastern mills are from $28 to $28.50, but the sales referred to above were considerably below these figures.

The feeling in the trade is that rails will be in large demand next year, for many new roads will be built, and several of the mills are expecting higher prices. Nevertheless, the lessening in cost which they are making by improvements in machinery and plant will, perhaps, offset the increased cost of the raw material and will enable them to maintain prices where they are without sacrificing any profit. There is no doubt but that the market for ore and coke being higher, the cost of Bessemer pig-iron will increase, and this, of course, is the foundation of the cost of rails.

*Old Rails* are still in demand, and we hear of 600 tons of tees having been sold at $23, while $25 has been offered for double-heads, without finding a seller. The stocks here are light, but the prices asked are usually beyond the views of manufacturers.

The remainder of the list of manufactured iron, including bar, structural iron and plates, is without change. The demand is fair without being large, and prices are steady without any notable tendency to advance. We refer to our "Current Prices," on another page, for the ruling quotations.

**Louisville.** Oct. 30.

[Special report by Messrs. HALL BROTHERS & Co.]

The week under review has been more quiet than the week previous. A good many consumers were announced in the market for round supplies of iron, but some of them, after thinking over the matter, decided that they would not buy until after the election. The election seems to be a question of great anxiety to both the buyers and sellers, and the furnaces are strongly of the faith that they will get more money after the election, and are not exceedingly anxious to offer; in fact, a great many have nothing to offer until after January or February, 1889. We are advised of a contract of about 2000 cable yokes by a Western concern, the order for which was placed in England at the price of $38 per ton delivered at Denver, Colo. This has been a great surprise to the manufacturers of this kind of work who were figuring on the same. It seems to be the general opinion that it matters not who is elected, but there will be quite an active market after the election. On November 1st freight advances to all points 20c. per ton on pig iron. We do not expect to see any great amount of business done until after the election, though there is quite a heavy business in prospect. Quotations for cash will be found in our weekly register of prices.

**Pittsburg.** Nov. 1.

[From our Special Correspondent.]

*Raw Iron.*—The past week has been one of reasonable activity for certain descriptions of iron, notwithstanding the fact of the presidential election being only four days off. Prices remain steady, with no anxiety on the part of holders and makers to force business, it being a well-known fact that the amount of raw material is considerably less than it was one week ago, and every twenty-four hours helps to diminish stocks, so that consumers will soon be in search of material to keep their works going and complete the orders now on hand. Leading dealers report a considerable amount of new business in sight. The absorption of pig-iron alone has been steady all through the fall, and the accumulation of stocks trifling, supplies in some instances being so low buyers have deemed it advisable within a short time to extend their purchases further than they had intended. The rolling mills are busy here and elsewhere, and hence forge iron is under a good deal of inquiry for the early part of next year. Again, other dealers are disposed to postpone the closing of large contracts until after the election, so that in a short time dealers will be able to form some definite idea in regard to the probable course of the market.

The Elba Iron Works have been leased to Mr. H. Darlington, who will start work at once. Skelp iron orders lately very large, the demand exceeding the supply, caused by the Elba and Millvale mills being out of the market. Muck bar firm and advancing, owing to all the puddling capacity being fully taken for some time to come. We know of one mill here building twenty new furnaces, and another building forty.

*Coal and Coke Smelted Lake Ore.*

| | |
|---|---|
| 1500 Tons Gray Forge, Dec. and Jan. | 16.00 cash. |
| 1500 Tons Gray Forge | 16.25 cash. |
| 1000 Tons Gray Forge | 16.25 cash. |
| 1000 Tons Gray Forge | 16.15 cash. |
| 1500 Tons Gray Forge, Extra | 16.50 cash. |
| 1000 Tons Gray Forge, Extra | 16.50 cash. |
| 1000 Tons Bessemer | 17.50 cash. |
| 1000 Tons Bessemer | 17.50 cash. |
| 600 Tons Gray Forge | 16.00 cash. |
| 500 Tons Gray Forge | 16.15 cash. |
| 100 Tons No. 2 Foundry | 17.00 cash. |
| 100 Tons No. 1 Foundry | 17.50 cash. |

*Coke, Native Ore.*

| | |
|---|---|
| 500 Tons Gray Forge | 16.00 cash. |
| 500 Tons Gray Forge | 16.00 cash. |
| 100 Tons Close Gray | 15.50 cash. |
| 300 Tons Gray Forge | 16.00 cash. |
| 50 Tons Mottled and White | 15.75 cash. |
| 50 Tons No. 1 Foundry | 18.00 cash. |
| 50 Tons Silvery | 16.50 cash. |
| 50 Tons Silvery | 17.00 cash. |
| 30 Tons Silvery | 17.25 4 mo. |
| 25 Tons No. 2 Foundry | 17.00 cash. |

*Steel Slabs and Billets.*

| | |
|---|---|
| 1000 Tons Billets | 29.50 cash. |
| 500 Tons Billets | 29.70 cash. |
| 500 Tons Nail Slabs | 28.50 cash. |
| 500 Tons Nail Slabs | 28.50 cash. |

*Muck Bar.*

| | |
|---|---|
| 1000 Tons Neutral, Nov. and Dec. | 29.75 cash. |
| 1000 Tons Neutral, " " | 29.50 cash. |
| 1000 Tons Neutral, " " | 29.50 cash. |
| 1000 Tons Neutral, " " | 29.25 cash. |
| 500 Tons Neutral, " " | 29.75 cash. |
| 500 Tons Neutral, " " | 29.75 cash. |

*Old Iron Rails.*

| | |
|---|---|
| 1000 Tons American T's | 25.00 cash. |
| 1000 Tons American T's | 25.00 cash. |
| 1000 Tons American T's | 24.25 cash. |
| 500 Tons American T's | 24.50 cash. |

*Ferro-Manganese.*

| | |
|---|---|
| 25 Tons 80 per cent | 56.00 cash. |

*Spiegel.*

| | |
|---|---|
| 25 Tons 20 per cent | 27.00 cash. |

**Philadelphia.** Nov. 2.

[From our Special Correspondent.]

The sales of steel rails during the past six days foot up to between fifty and fifty-five thousand tons, so far as reports show. There are inquiries for rails to-day in Pennsylvania mills which foot up 70,000 tons in all. Quotations are $28 to $28.50. Makers are less willing than ten days or two weeks ago to accept anything below their asking prices. Two causes are bringing this strengthening tendency about. First, the increasing demand for rails; 2d, the advance in cost for material. The course of rails for the next six months will probably be determined within thirty days, and the points that will send prices up, if they advance, will be the placing of orders for somewhere between 60,000 tons and 100,000 tons in the different mills of the country. There are a good many offers on the market at present, but for the cause named before business has not been closed up to present writing. Buyers will likely yield and sales will in all probability be made before the close of the week at $27.50. The object of the makers in accepting a few large lots at small figures will be first to secure the business, and second to give a spur to demand with the hope that the smaller buyers will fall into line.

Several large lots of old rails have been contracted for. Prices not named. Nothing is being done in small store lots. Buyers are still refusing to pay asking prices. The difference between buyers and sellers is from fifty cents to one dollar.

The past six days have brought out a good many buyers for pig-iron, chiefly forge. Five hundred and 1000 lots have been bought for delivery this month, but the bulk for later delivery at $16.50 to $17. There are a good many parties in this city who would like to be better covered in pig-iron and feel that they are running a risk in delaying contracts. A good many small buyers have been purchasing foundry, and there is a probability that a more active movement in Nos. 1 and 2 foundry will set in at once. Quotations have not been changed. A good movement is in progress in all kinds of blooms. There is less activity in muck bars, owing to the determination of makers to have fifty cents per ton more than the prices ruling four weeks ago. The nail market is without change. There is a good deal of difference in prices of different makes.

Bar iron orders have fallen off, but the mills are so well fixed that they do not feel it. The inquiries for skelp iron this week show that there are a good many requirements to be covered. Manufacturers of wrought-iron pipes and tubes are crowding their ca-

pacity to the utmost to make room for new business. Several new boiler tube orders were placed this week.

There is no difficulty in booking orders for merchant steel. Sheet steel has been in active demand this week. The makers have some good orders calling for the earliest possible delivery. The ship builders are completing specifications for large orders for placing this month. Negotiations will be done in a few days. Mill men are anxious to make back-logs out of this business to see them through during the winter. It is intimated that some large contracts in plate and tank will be placed rather low on that account. There is very little to be reported this week from the structural iron makers. Former reports are repeated concerning the probabilities for big business this winter, but only small orders have been taken.

Another good week has been had in sheet iron.

Scrap iron is very active, but the supplies are light and yard men are making extra efforts to supply customers, with the result of stiffening rates a little, though there is no absolute change in quotations.

## FINANCIAL.

NEW YORK, Friday Evening, Nov. 2.

The business of the mining share market continues to be quiet. The transactions have been small as compared with previous weeks, and the prices show but little change.

We have received several inquiries from our readers concerning the Taylor-Plumas Mining and Milling Company, of Plumas County, Cal., which last appeared in public on our exchange some time ago at 1@3 cents per share. We are informed by the secretary of the company, Mr. L. L. Levy, that work of all kind has been entirely suspended owing to the lack of money and the unwillingness of the stockholders to contribute anything for further work. Mr. Levy says that the true value of the property is as yet unknown, but he thinks that according to the statements of experts who have examined it, the shareholders would be justified in contributing something to carry on further work. The mine is conveniently situated near Greenville, the cost of transportion is thus reduced, and the company has a ten stamp mill, with all necessary mining machinery erected on the property. The only thing lacking, says Mr. Levy, is that all-important essential—money. The stock is non-assessable, and if the stockholders do not "put up," he says, they themselves are only to blame for the consequences.

Little is doing in Bodie Consolidated, which ruled at from $2.10 to $2.20. Standard showed an upward tendency, and went from $1.25 to $1.55.

Plymouth Consolidated has advanced to $9.63, and now that work has been resumed at the mine, the price of the stock will probably take an upward turn.

Brunswick shows one sale at 10c.

Quicksilver Common shows several sales, and advanced from $9.25 to $9.63.

There was little change in the price of the different Amador stocks. Amador remained as last week at $2.25, Middle Bar at from 40c. to 42c., Astoria at 24c. and Hollywood at 40@41c.

Phœnix, of Arkansas, which is now but rarely dealt in, was quoted at from 25@30c.

Silver King was one of the most active stocks on the list. The price opened at $1.75, but later in the week declined to $1.50; the last sales made were at from $1.50@$1.60.

Rappahannock was quoted all week at 10c.

One hundred shares of the Daly Mining Company, of Utah, are offered for sale on the Consolidated Stock and Petroleum Exchange at $16 per share, ex-dividend. Also a lot of Amy & Silversmith Consolidated Mining Company's stock.

The Horn-Silver Mining Company is now installed in less pretentious offices at 52 Broadway, and we presume that the economical régime has now commenced. The company has a surplus in the treasury of some $83,000, and the mine has been earning about $1000 a month during the past year. There are no important debts, and we trust that the interests of the stockholders will now be conscientiously considered, and that the true value of the property, whatever it may be, will be ascertained. We understand that the mine will shortly be examined by some mining expert. The price of the stock this week has ruled at from 85 to 90c.

Notwithstanding the good reports from the Consolidated California & Virginia Mining Company and the regular monthly dividends, little is doing in the stock, which declined this week from $11 to $10.50. Hale & Norcross shows one sale of five shares at $6 per share; Sierra Nevada one at $4.10; Bullion at $2.20 to $2.25; Exchequer at $1.80.

Sutro Tunnel stock was dealt in to the extent of 28,545 shares, at from 9 to 13c. The trust certificates opened at 70c., but later declined to 68c.

Navajo declined from $2.75 to $2.45, but later advanced again to $2.70, and to-day sold at $2.50, and North Belle Isle was quiet at from $2.35 to $2.40.

Barcelona went from 80 to 75c.

Ontario continues to be firm at from $33 to $33.50.

United Copper remains steady at from $1.15 to $1.25.

Colchis continues to be quite active. In the begining of the week the price declined from $2.30@$2.15, but

## IMPORTS AND EXPORTS OF METALS AT NEW YORK OCTOBER 23 TO OCTOBER 29, AND FROM JANUARY 1.

### IMPORTS.

| Spelter. | Week. Tons. | Year. Tons. |
|---|---|---|
| Am. Metal Co.. | ..... | 303 |
| Fr'densvi'eZ.Co. | ..... | 23 |
| Hendricks & B.. | ..... | 56 |
| Lamarche's S's.. | ..... | 6 |
| Lewisohn Bros. | ..... | 61 |
| Macy's Sons.... | ..... | 28 |
| Muller, S. & Co. | ..... | 56 |
| Naylor & Co.... | ..... | 214 |
| Osgood, F..... | ..... | 83 |
| Perkins, C. L.. | ..... | 725 |
| Pope's S's & Co. | ..... | 28 |
| Total..... | ..... | 1,583 |
| Corres. date 1887 | ..... | 2,911 |

| Zinc Sheets. | Tons. | Tons. |
|---|---|---|
| G.A.&E.Meyer.. | ..... | 1 |
| Lemanche's S's. | 2 | 596 |
| Milne & Co..... | ..... | 1 |
| Naylor & Co.... | ..... | 137 |
| Total..... | 2 | 735 |

| Pig Lead. | Tons. | Tons. |
|---|---|---|
| Am. Metal Co.. | ..... | 22 |
| Caswell, E. A... | ..... | 46 |
| Corwith & Co... | ..... | 111 |
| Hendricks Bros. | ..... | 122 |
| Total..... | ..... | 301 |
| Corres. date 1887 | ..... | 3,883 |

| Antimony. | Casks. | Casks. |
|---|---|---|
| Total..... | 50 | 2,640 |
| Corres. date 1887 | 134 | 3,223 |

| Copper. | Pounds. | Pounds. |
|---|---|---|
| Lewisohn Bros. fromLiverpool | ..... | 161,824 |

| Nickel. | Lbs. | Lbs. |
|---|---|---|
| McCoy&Sanders | ..... | 169,586 |
| Total..... | ..... | 169,586 |

| Tin. | Tons. | Tons. |
|---|---|---|
| Abbott & Co.... | ..... | 3,448 |
| Am. Metal Co.. | 28 | 507 |
| B'dwell&French | ..... | 89 |
| CrookeS.&R.Co. | ..... | 469 |
| Crooks & Co.... | ..... | 67 |
| Davol & Sons... | ..... | 8 |
| Dickerson, VanD | ..... | 10 |
| Funch, Edye&Co | ..... | 10 |
| Hendricks Bros. | ..... | 181 |
| Knauth, W. & K | 11 | 48 |
| Lehnaier Sons.. | 7 | 43 |
| Lewisohn Bros.. | ..... | 15 |
| Muller, S'll &Co. | 22 | 4,670 |
| Nathan, Trotter | ..... | 22 |
| Naumann, F.... | ..... | 8 |
| Naylor & Co.... | 84 | 1,580 |
| Phelps, Dodge.. | 196 | 1,045 |
| Pope, Jas. E.,Jr. | 6 | 140 |
| Pope's Sons & Co | ..... | 124 |
| Schwaerer Bros. | ..... | 7 |
| Thomsen, A. A.. | 11 | 39 |
| Thomson, D..... | 11 | 225 |
| Total..... | 376 | 12,703 |
| Corres. date 1887 | 310 | 12,068 |

| Tin Plates. | Boxes. | Boxes. |
|---|---|---|
| Am. Metal Co.. | ..... | 509 |
| Bartlett & Co... | ..... | 200 |
| Bridge & Beach | ..... | 339 |
| Bruce & Cook.. | 3,073 | 85,346 |
| Byrne, James... | ..... | 46,936 |
| Cen. Stam. Co.. | 1,926 | 32,943 |
| Coddington&Co | 3,100 | 137,117 |
| Corbierre, F.& S. | ..... | 2,249 |
| Cort & Co., N. L. | 1,989 | 96,599 |
| C. Fruit Jar Co. | ..... | 1,366 |
| Crocker Bros... | ..... | 548 |
| Crooks & Co.... | 2,100 | 58,370 |
| De Mill & Co... | 200 | 18,013 |
| Dickerson, V. D. | 9,554 | 233,557 |
| Dolly, T. G. F... | ..... | 112 |
| Fairbanks, N.H. | ..... | 264 |
| Hamilton & M.. | ..... | 362 |
| Henly & Earle.. | ..... | 38 |
| Iron Clad M. Co. | ..... | 119 |
| Lalance & Gr'j'n | 328 | 4,735 |
| Lombard, Ayres | ..... | 15,693 |
| Merchant & Co. | ..... | 15,427 |
| Mersick & Co... | ..... | 5,740 |
| Morewood & Co | 900 | 40,008 |
| Naylor & Co.... | ..... | 8,978 |
| Newall Bros.... | ..... | 208 |
| Phelps, Dodge.. | 14,759 | 572,313 |
| Potts, Son & Co. | ..... | 573 |
| Pratt Mfg. Co.. | 1,196 | 141,311 |
| Saunders Bros.. | ..... | 330 |
| Shepard & Co... | 225 | 77,204 |
| Smith & L'kw'd. | ..... | 200 |
| Somers Bros.... | ..... | 768 |
| Stroud & Co.... | ..... | 686 |
| Taylor, N. & G.. | ..... | 540 |
| Thomsen & Co.. | 5,613 | 136,121 |
| Underhill, A. M. | ..... | 21 |
| Warren & Co... | ..... | 1,665 |
| Wheeler & Co.. | 266 | 7,049 |
| Whittemore&C. | 1,614 | 45,525 |
| Wolff & Reesing | 2,003 | 26,449 |
| Wright & Sons. | ..... | 165 |
| Total..... | 48,846 | 1,817,696 |
| Corres. date 1887 | 53,192 | 1,686,265 |

| Pig-Iron. | Tons. | Tons. |
|---|---|---|
| Abbott & Co.... | ..... | 600 |
| Austin & Co.... | ..... | 100 |
| Baldwin Bros... | ..... | 100 |
| Bartlett & Co... | 100 | 4,800 |
| Carter, G. T.... | 130 | 130 |
| Crocker Bros... | 700 | 10,972 |
| Crooks & Co.... | ..... | 750 |
| Dana & Co..... | ..... | 1,100 |
| Downing & Co.. | ..... | 251 |
| Drum'nd, McC'll | ..... | 20 |
| Erie Despatch.. | ..... | 250 |
| Foley, E..... | ..... | 200 |
| Henderson Bros. | ..... | 1,895 |
| Holt, H. N..... | ..... | 50 |
| Irvin & Co..... | ..... | 50 |
| Knauth, N.& K. | ..... | 15 |
| Lee & Co..... | ..... | 375 |
| Milne & Co., A. | ..... | 2,467 |
| Naylor..... | 750 | 6,618 |
| Perkins, C. L.. | ..... | 5 |
| Pierson & Co.... | ..... | 15 |
| Page, New'l &Co | ..... | 13 |
| Pope, J. E., Jr.. | ..... | 150 |
| Pratt Mfg. Co.. | ..... | 10 |
| Sanderson&S'ns | ..... | 2 |
| Stetson & Co... | 100 | 12,207 |
| Tonsila, M. R... | ..... | 120 |
| Walbaum, W.H. | ..... | 400 |
| West. Dispatch. | ..... | 50 |
| Williamson &Co | 100 | 4,600 |
| Wright & Son.. | ..... | 20 |
| Total..... | 1,880 | 48,135 |
| Corres. date 1887 | 2,000 | 126,472 |

| Steel Sheets, Billets, Forgings, etc. | Tons. | Tons. |
|---|---|---|
| Abbott & Co.... | 9 | 2,115 |
| Arkell, Jas..... | ..... | 17 |
| Belcher, H. U... | ..... | 13 |
| Bowker, C. F... | 11 | 281 |
| Bruce & Cook... | ..... | 7 |
| Carey & Moen.. | ..... | 24 |
| Carter, G. T..... | 160 | 934 |
| Coe, J. A..... | ..... | 16 |
| Cohn, M..... | ..... | 159 |
| Cooney, D. J.... | ..... | 20 |
| Crooks & Co.... | ..... | 788 |
| Crousbey, H.... | ..... | 236 |
| Dana & Co..... | 315 | 1,770 |
| Downing & Co. | ..... | 415 |
| Henderson Bros. | ..... | 31 |
| Holt, H. N..... | ..... | 6 |
| Hondolette & D. | ..... | 136 |
| Hugill, Chas.... | 5 | 180 |
| Irwin & Son.... | ..... | 1 |
| Lalance & G.... | 7 | 267 |
| Lazard Freres.. | ..... | 50 |
| Leng, J. S..... | ..... | 53 |
| Lebenberg, N.... | ..... | 36 |
| Littlejohn, Jas. | ..... | 40 |
| Lundberg, G.... | ..... | 205 |
| Mersick & Co... | ..... | 128 |
| Milne & Co..... | 76 | 1,812 |
| Montgomery&C | ..... | 52 |
| Moore's Son&Co | ..... | 25 |
| MullerSchall&C | ..... | 5 |
| Manas & Son.... | ..... | 10 |
| Naylor & Co.... | 1,234 | 12,414 |
| Newton&Shipm | 8 | 75 |
| Oelrich & Co... | 82 | 180 |
| Ogd'n & Wallace | ..... | 296 |
| PhelpsDodge&C | ..... | 3 |
| Phœnix Steel Co | ..... | 20 |
| Pierson & Co... | 42 | 949 |
| Pilditch, F. S... | ..... | 337 |
| Power, C. W.... | ..... | 53 |
| PrattWhi'y&Co | ..... | 33 |
| Prosser, Thos... | ..... | 3,065 |
| Roebling's Sons. | ..... | 390 |
| Sanderson& Son | ..... | 42 |
| Seaburg, C. B.. | ..... | 2 |
| Shotts Iron Co.. | ..... | 15 |
| Strouse & Co.... | ..... | 37 |
| Temple & S..... | 2 | 12 |
| Union Bridge Co | ..... | 288 |
| Wagner, W. F.. | 20 | 996 |
| Walbaum, W.H. | ..... | 2,479 |
| Wallace & Co.. | ..... | 41 |
| Webb, J. B..... | ..... | 1 |
| Wetherall Bros. | ..... | 2 |
| Wetherill & Co. | ..... | 5 |
| Wheeler & Co.. | ..... | 12 |
| Whiting, E. W. | ..... | 11 |
| Whitney & Co.. | ..... | 51 |
| Williams&Whit | 10 | 12 |
| Wilson, J. G.... | ..... | 112 |
| Whittemore & C | ..... | 6 |
| Wolff, R. H .... | ..... | 379 |
| Wright's S.&Co. | ..... | 10 |
| Total..... | 2,981 | 33,132 |
| Corres. date 1887 | 2,976 | 78,449 |

| Bar-Iron. | Tons. | Tons. |
|---|---|---|
| Abbott & Co.... | 35 | 2,480 |
| Abeel Bros..... | ..... | 3 |
| Bacon & Co..... | ..... | 150 |
| Hugh Cranshaw | ..... | 1 |
| Downing & Co.. | ..... | 151 |
| Holt, S. N..... | ..... | 85 |
| Jacobus, E. Y... | ..... | 16 |
| Lilienberg, N.... | ..... | 16 |
| Lundberg, Gust | ..... | 700 |
| Mersick & Co.. | ..... | 29 |
| Milne & Co..... | ..... | 283 |
| Naylor & Co.... | ..... | 515 |
| Ogd'n & Wallace | ..... | 4 |
| Page Newell &C | ..... | 122 |
| Philips, C. M... | ..... | 20 |
| Stroud & Co.... | ..... | 8 |
| Wallace & Co.. | ..... | 19 |
| Wilson, J. G.... | ..... | 11 |
| Totals..... | 35 | 4,610 |
| Corres. date 1887 | 400 | 13,400 |

| Steel & Iron Rods. | Tons. | Tons. |
|---|---|---|
| Abbott & Co., J.. | 301 | 6,823 |
| Amer. Screw Co. | ..... | 858 |
| Bacon & Co..... | ..... | 223 |
| Baldwin B. & C. | ..... | 53 |
| Bowker, C. F... | ..... | 3 |
| Carey & Moen.. | ..... | 765 |
| Cohn, M..... | ..... | 69 |
| Dana & Co..... | 253 | 5,632 |
| Downing & Co.. | ..... | 347 |
| Galpin, S. A.... | ..... | 2,742 |
| Heyn, A..... | 101 | 1,908 |
| Hondolette & D. | ..... | 30 |
| Hugill, Chas.... | ..... | 41 |
| Jacobus, E. Y... | ..... | 12 |
| Lazard Freres.. | ..... | 695 |
| Leng, J. S..... | ..... | 850 |
| Lilienberg, N.... | ..... | 450 |
| Lundberg, G.... | ..... | 120 |
| Milne & Co., A. | ..... | 1,408 |
| Montgomery&C | ..... | 73 |
| Muller, Schall&C | ..... | 150 |
| Naylor & Co.... | 619 | 18,105 |
| Newton& Ship'n | ..... | 2 |
| N.Y.Barb W.Co. | ..... | 20 |
| Page, Newell& C | ..... | 152 |
| Perry & Ryer... | ..... | 100 |
| Pierson & Co... | 20 | 51 |
| Pilditch, F. S... | ..... | 21 |
| Prosser, Thos... | ..... | 162 |
| Roebling's Sons. | 15 | 1,750 |
| Sanderson& Son | ..... | 67 |
| Sheldon & Co... | ..... | 11 |
| Walschid, C. A. | ..... | 15 |
| Washburn M.Co | ..... | 35 |
| Whittemore & C | ..... | 1,705 |
| Wilson, J. G.... | ..... | 26 |
| Wolff & Co. .... | 125 | 2,530 |
| Total..... | 1,434 | 47,271 |
| Corres. date 1887. | 2,313 | 108,143 |

| Old Rails. | Tons. | Tons. |
|---|---|---|
| Baldwin Bros.. | ..... | 100 |
| Bowen'g & Arch. | ..... | 100 |
| Brown B. & Co. | ..... | 668 |
| Crossman & Bro | ..... | 1,005 |
| D., L. & W. R. R. | ..... | 409 |
| Frankfort, M... | ..... | 100 |
| Geisenheimer&C | ..... | 100 |
| Henderson Bros. | ..... | 537 |
| Neuma'k&Gross | ..... | 1,912 |
| Stetson & Co.... | ..... | 230 |
| Waltam & Co.... | ..... | 300 |
| Winter & Smil'ie | ..... | 80 |
| Total..... | ..... | 5,541 |
| Corres. date 1887. | 3,643 | 143,808 |

| Sheet Iron. | Tons. | Tons. |
|---|---|---|
| Bruce & Cook.. | ..... | 53 |
| Coddington& Co | 30 | 1,644 |
| Crooks, R. & Co. | ..... | 10 |
| Newton & S..... | ..... | 4 |
| Thomsen & Co.. | ..... | 2 |
| Wagner, W. F.. | ..... | 40 |
| Whitney & Co.. | ..... | 15 |
| Total..... | 30 | 1,768 |
| Corres. date 1887. | 50 | 1,785 |

| Scrap Iron. | Tons. | Tons. |
|---|---|---|
| Boothby, J. H.. | ..... | 80 |
| Bowring&Arch. | ..... | 200 |
| Brown B. & Co.. | ..... | 20 |
| Burgess & Co... | ..... | 172 |
| Crossman & Co. | ..... | 47 |
| Froth'hamB.&C | ..... | 248 |
| Geisenheimer&C | ..... | 565 |
| Gerhardt, P. T.. | ..... | 8 |
| Johnson & Co... | ..... | 85 |
| Muller, Schall&C | ..... | 15 |
| Ne'mark&Gross | ..... | 321 |
| Purdon & W. .. | ..... | 75 |
| Salter & L..... | ..... | ..... |
| Trowbridge& Co | ..... | 75 |
| Ward & Co..... | ..... | 150 |
| Total..... | ..... | 1,951 |
| Corres. date 1887. | ..... | 16,251 |

| Charcoal Iron. | Tons. | Tons. |
|---|---|---|
| Abbott & Co.. | ..... | 3 |
| Bacon & Co... | ..... | 102 |
| Downing & Co.. | ..... | 25 |
| Lilienberg, N.... | ..... | 15 |
| Lunberg, G..... | ..... | 16 |
| Mersick & Co... | ..... | 6 |
| Milne & Co..... | ..... | 137 |
| Muller, S. & Co. | ..... | 124 |
| Naylor & Co.... | ..... | 752 |
| Page, N. & Co.. | 20 | 539 |
| Sanderson & S. | ..... | 1 |
| Total..... | 20 | 1,783 |

| Spiegeleisen. | Tons. | Tons. |
|---|---|---|
| Abbott & Co.... | ..... | 205 |
| Arkell, Jas..... | ..... | 78 |
| Crocker Bros ... | ..... | 5,086 |
| Dana & Co..... | 415 | 4,103 |
| Geisenheimer&Co. | 10 | 313 |
| Jansen, J. A.... | ..... | 11,033 |
| Naylor & Co.... | 1,210 | 13,196 |
| Perkins, C. L... | ..... | 3,343 |
| Pierson & Co.... | ..... | 1,050 |
| Post, M. & Co.. | ..... | 320 |
| Total..... | 1,635 | 38,727 |
| Corres. date 1887 | 1,387 | 101,785 |

| Iron Ore. | Tons. | Tons. |
|---|---|---|
| Cormack & Co.. | ..... | 1,022 |
| Danagh & G.... | ..... | 25 |
| De Flores, R.... | ..... | 7,478 |
| Earnshaw, A.... | ..... | 6,361 |
| Ennis & Co..... | ..... | 1,721 |
| Johnston & Co. | ..... | 300 |
| Naylor & Co.... | ..... | 3,706 |
| Outerbridge&Co | ..... | 340 |
| Wright & Co... | ..... | 1,630 |
| Total ..... | ..... | 22,583 |
| Corres. date 1887. | ..... | 54,153 |

### EXPORTS.

| Copper. | Pounds. | Pounds. |
|---|---|---|
| Abbott & Co.... | ..... | 11,491,808 |
| Amer. Metal Co. | 116,000 | 6,254,449 |
| Becker & Co.... | ..... | 1,250 |
| Bridgpt.Copper C | ..... | 112,000 |
| Copper Queen.. | ..... | 224,034 |
| Crooks & Co.... | ..... | 1,000 |
| Crossman & Bro | ..... | 4,000 |
| Herold, E..... | ..... | 250,000 |
| Ismay, J. B .... | ..... | 115,000 |
| Jones, R. W.... | ..... | 189,984 |
| Ladenburg & Co | ..... | 220,371 |
| Ledoux & Co.... | ..... | 110,276 |
| Lewisohn Bros. | ..... | 4,979,004 |
| Lomal, F. A.... | ..... | 2,691,293 |
| Mendel, S..... | ..... | 560,000 |
| Muller, Schall.. | ..... | 1,105,000 |
| Naylor & Co.... | ..... | 462,709 |
| Neumark & G.. | ..... | 120,143 |
| Orford Co..... | ..... | 574,881 |
| Parsons & Co... | ..... | 420,000 |
| Phelps, Dodge.. | ..... | 230,664 |
| Pope's Sons .... | ..... | 1,917,780 |
| Todd & Co..... | ..... | 112,026 |
| Wolms & Trhne | ..... | 99,320 |
| Total..... | 116,000 | 32,365,996 |
| Corres. date 1887. | ——— | 9,921,470 |

| Copper Matte. | | |
|---|---|---|
| Abbott & Co.... | 42,447 | 643,592 |
| Amer. Metal Co | 319,698 | 4,877,046 |
| Kunhardt & Co. | ..... | 41,652 |
| Freidensv'le Zinc Co..... | 56,000 | 56,000 |
| Ledoux, Chas... | ..... | 454,000 |
| Ledoux & Co.... | ..... | 469,720 |
| Lewisohn Bros.. | ..... | 1,126,822 |
| Nichols & Co... | ..... | 516,783 |
| Wilm's, Terhune | 297,100 | 37,516,715 |
| Total..... | 715,545 | 42,987,101 |
| Corres. date 1887. | ——— | 36,966,222 |

| Copper Ore. | | |
|---|---|---|
| Amer. Metal Co. | ..... | 524,698 |
| Kunhardt & Co. | ..... | 37,682 |
| Mallory & Co... | ..... | 167,065 |
| tann, John H.... | ..... | 28,000 |
| Total ..... | ..... | 757,445 |
| orres. date 1887 | ..... | 681,068 |

## CURRENT PRICES.

### CHEMICALS.

**Acid**—Acetic, ℔ 100 lbs..... 2.00
Muriatic, 18°, ℔ 100 lbs ... .. 1.15@1.20
Muriatic, 20°, ℔ 100 lbs..... .. 1.35@1.50
Nitric, 36°, ℔ 100 lbs ... ..... 4.00@5.50
Nitric, 42°, ℔ 100 lbs..... ..... 5.50@7.00
Oxalic, ℔ 100 lbs..... ..... 8.50@9.00
Sulphuric, 60°, ℔ 100 lbs. ..... 90@95
Sulphuric, 66°, ℔ 100 lbs ..... 95@1.25
**Alkali**—36 p. c..... .. .. 1.12½@1.15
48 p. c ..... .....1.22½@1.25
Refined, 58°..... .....1.15 @1.25
**Alum**—Lump, ℔ lb..... .. .... 1¾
Ground, ℔ lb.. ..... .....1½@2
Lump, ℔ ton, Liverpool ..... ..... £5
Sulphate of Alumina, ℔ ton.....£3 15
**Aqua Ammonia**—18°, ℔ lb..... 4¾
20°, ℔ lb..... .. ..... 6
22°, ℔ lb ..... .. ..... 6@7
26°, ℔ lb..... .....10@11
**Ammonia**—Sul., ℔ 100 lbs..... 3.35
Carb., per lb..... .....7¾
Muriate, per lb... .....6¼@ 8
**Arsenic**—White, powdered, ℔ lb.3¼@3½
Red. ℔ lb ..... .. 5½@5¾
White, at Plymouth, ℔ ton. .. £11 10
**Asbestos**—Am., p. ton.....$20@$120
Italian, p. ton, c. i. f. L'pool ..£50@£300
**Asphaltum**—P. ton .....13.00
Prime Cuban, ℔ lb .. ..... 5@6c.
Hard, ℔ ton..... .. ..... $28.00
Trinidad, refined, ℔ ton..... $30.00
**Barytes**—Sulph., Am. prime white17.00
Sulph., foreign, floated, p. ton....20.00
Sulph., off color, p. ton . .....12.50
Carb., lump, f.o.b. L'pool, ton....£6 0 0
No. 1, casks, Runcorn " "£4 10 10
No 2, bags, Runcorn " " 3 15 0
**Bleach**—Over 35 p.c., ℔ lb. ..2.06¼@2.25
**Borax**—℔ lb ..... .. 7¾
Refined at Liverpool, ℔ ton.... .. £31
**Brimstone**—*See Sulphur.*
**Bromine**—℔ lb..... .....36
**Chalk**—℔ ton..... .... .. .. 3.50
Precipitated, ℔ lb. ..... 4
**China Clay**—English, ℔ ton. .... 18.50
Southern, ℔ ton..... .... ..... 13.50
**Chrome Yellow**—℔ lb..... .... 10@25
**Cobalt**—Oxide, ℔ lb..... ..2.50@2.90
**Copper**—Sulph. English Wks.,ton£20 10s.
Precip., Eng. Wks, unit.. ..fluctuating
**Copperas**—Common, ℔ 100 lbs... 62½
Best, ℔ 100 lbs..... .. .... 1.00
Liverpool, ℔ ton, in casks ..£1 16 1.20
**Cream of Tartar**—Am. 99%....32@32¾
Powdered, 99 p. c..... ..... 33½
**Emery**—Grain, ℔ lb ... ..... .... 4
Flour, ℔ lb ..... ..... 2½
**Feldspar**—Ground, ℔ ton..... .....15.00
**Fuller's Earth**—Lump, ℔ bbl. .90@95
Powdered, ℔ lb.. .. ..... 2
**Gypsum**—Calcined, ℔ bbl. .. .... 1.25
**Iodine**—Resublimed..... .... 3.60
**Kainit**—℔ ton..... .... 9.72@10.50
**Kaolin**—*See China Clay.*
**Lead**—Red, ℔ lb. ..... .... 6
White, American, in oil, ℔ lb. .... 6½
White, English, ℔ lb ..... ..... 7½
Acetate, or sugar of..... .....13@13½
**Lime Acetate**—Amer. Brown.1.15@1.10
" Gray2.10@2.12½
**Litharge**—Powdered, ℔ lb .. .. .. 6@6¼
English flake, ℔ lb..... ..... 9
**Magnesite**—Greek, ℔ ton..... ..10.00
**Manganese**—lump, c.i.f. L'pool. 55s.
Per unit, up or down..... ..... 1s. 6d.
Ground ..... .....£5 10
**Mercuric-Chloride**—(*Corrosive Sublimate*) ℔ lb..... ..... 55
**Mineral Wool**—℔ lb..... ..... 2
**Mica**—In sheets according to size,
1st quality, ℔ lb..... .....25@$6 00
**Phosphate Rock**—S. Carolina,
per ton f. o. b. Charleston..... 5.00
Ground, ex vessel New York.9.50@9.75
Canadian Apatite, lump, f. o. b. at
shipping port, ℔ unit..... .. .. 24
**Phosphorus**—℔ lb..... ..... 65
**Plumbago**—Ceylon, ℔ lb. .... 4@5
American, ℔ lb..... .....5@7
London, ℔ cwt..... .....£0 15 0
**Potassium**—Cyanide, ℔ lb..... .30@40
Bromide, ℔ lb..... .. .. 37
Chlorate, ℔ lb. ..... .....14½@14¾
Carb. ℔ lb. ..... ....4.70@5.50
Caustic, ℔ lb..... .. 7½@8
Iodide..... .. .. .2.70@2.75
Muriate, ℔ 100 lbs... ..... ..1.80@1.85
Nitrate, refined, ℔ lb..... .. 6
Bichromate, ℔ lb .... ..... 10½
Sulphate, ℔ 100 lbs. ..... .. 2 30
Yellow Prussiate, ℔ lb.... .. .... 19
Red Prussiate, ℔ lb... .. ..... 42
**Pumice Stone**—Select lumps, lb. 3¼
Original cks., ℔ lb.... .. ..... 1¾
Powdered, pure, ℔ lb.. .. .. .. 2¼@2½
**Pyrites**—Non-cupreous, p. unit, s. 5d.
**Quartz**—Ground, ℔ ton. ..... 18.00
**Rotten Stone**—Powdered, ℔ lb..3¼@3½
Lump, ℔ lb..... ..... ..... 6@10
Eng., powdered, ℔ ton. ... ..... £4
Lump, ℔ ton..... ..... £5
**Salt**—Liverpool, ground ℔ bbl. . 75@80
Turk's Island, ℔ bbl ..... .30@33
**Salt Cake**—℔ 100 lbs. .....50@57
**Saltpeter**—Crude, ℔ lb. ... .. .. 5@5¼
Refined, ℔ lb..... ..... 6@8
**Soda Ash**—Carb.,48 ℔ 100 lb...1.25@1.37½
High test ..... ... .... 1.12½@1.15
Caustic, 48 ℔ ... .. .....1.26¼@1.35
Soda Caustic, 60%.....2.60@2.87½
" " 70%.....2.40 @2.45
" " 74–5%.....2.37½@2.45
Sal, English, ℔ 100 lbs.... .97½@1.10
Sal, American, ℔ 100 lbs .... .95 @1.20
Nitrate, ℔ 100 lbs..... .....2.20 @ 2.25
**Strontium**—Nitrate ℔ lb. ..... 10½
**Sulphur**—Roll, ℔ lb..... ... .... 1¾
Flour, ℔ lb ..... ..... 2
Crude Brimstone, 2s., ℔ ton.20.00@23.00
Crude Brimstone, 3ds, ℔ ton.19.50@21.00
**Talc**—Ground French, ℔ lb.. ... .. 1
Domestic, ℔ lb..... .... .... ..... ¼
Domestic, ℔ ton..... ..... ..... 15 00
c. i. f. Liverpool, ℔ ton..... .. £4 50
**Tannin**—Pure, ℔ lb. . .....
**Vermillion**—American, ℔ lb.. .. 58
English, ℔ lb.. ..... 82@85
**Vitriol**—(Blue), Ordinary, ℔ lb..5¾@6½
Extra, ℔ lb. ..... ..... 6½@6¾
**Zinc Oxide**—Am., Dry, ℔ lb. .... 4½
Antwerp, Red Seal, ℔ lb..... .....6@6½
Paris, Red Seal, ℔ lb. ..... .....6½@7
* Spot.

### BUILDING MATERIAL.

**Bricks**—Pale, per 1,000 ..... 2.50@2.75
Jerseys, per 1,000 . ..... 4.50@5.00
Hackensacks..... ..... 5.00@5.25
Up Rivers, per 1000.. ..... 5.00@5.50
Haverstraw seconds, per 1000 5.25@5.75
Haverstraw firsts, per 1,000.. 6.00@6.50
Fronts, nominal.
Croton..... ..... 14.00@16.00
Wilmington. ..... 20.00@21.00
Philadelphia..... ... ... .. 28.00@29.00
Trenton ..... @28.00
Baltimore..... ..... 37.00@41.00
**Building Stone**—Amherst
freestone, per cu. ft... ..... 95@1.00
Brownstone, per cu. ft. ..... 1.00@1.35
Belleville, N. J., red and gray
rock, ℔ cu. ft.. ..... 1.00
Corncockle red freestone, ℔ cu.
ft..... ..... 1.00
Granite, rough, ℔ cu.ft..... . 45@1.25
Granite, Scotch..... ..... 1.00@1.05
**Cement**—Rosendale, ℔ bbl .. .90@1.00
Portland, American, ℔ bbl. . 2 00@2.15
Portland, foreign, ℔ bbl..... 2 20@2.45
Keene's coarse. ..... 4 50@5.50
Keene's fine..... ..... 7.00@8.25
**Slate**—Purple and green roofing, per 100 ft ..... 5.00@6 00
Red roofing, per 100 sq. ft... 15.00
Black, roofing, per 100 sq. ft. 4.00@5 00
**Lime**—Rockland, common.... 1.00@1 20
Rockland, finishing..... ..... 1.25
St. John, com. and finish ..... .90
**Labor**—Ordinary, per day.... 1.50@2 00
Masons, per day..... ..... 4.00
Plasterers, per day..... ..... 4.00
Carpenters, per day..... ..... 3.50
Plumbers, per day ..... ..... 3.50
Painters, per day..... ..... 2.50@3.50
Stonesetters, per day..... ..... 3.50@4 00
Tilelayers, ℔ day..... ..... 3.50@4.50
Bricklayers, ℔ day..... ..... 4 00

### THE RARER METALS.

**Aluminum**—(Metallic), per lb...$5 00
**Arsenic**—Metallic, per lb..... 32
**Barium**—(Metallic), per lb..... .975.00
**Bismuth**—(Metallic), per lb..... 2.40
**Cadmium**—(Metallic), per lb....150 00
**Calcium**—(Metallic), per oz..... 1.50
**Cæsium**—(Metallic)..... .....
**Cerium**—(Metallic), per oz..... .160.00
**Chromium**—(Metallic), per lb...200 00
**Cobalt**—(Metallic), per lb..... .. 6.00
**Didymium**—(Metallic), per oz.. .160.00
**Erbium**—(Metallic), per oz.... ...140.00
**Gallium**—(Metallic), per oz ....3250.00
**Glucinum**—(Metallic) ..... 4.50
**Indium**—(Metallic), per oz..... 158.00
**Iridium**—(Metallic), per lb.. .. 650.00
**Lanthanum**—(Metallic), per oz.175.00
**Lithium**—(Metallic), per oz.....160.00
**Magnesium**—Per lb..... .. 4.00
**Manganese**—Metallic, per lb... 1.10
**Molybdenum**—(Metallic), per oz. 6.00
**Nickel**—(Metallic), per lb..... .65
**Niobium**—(Metallic), per oz.....128.00
**Osmium**—(Metallic), per lb .... 640.00
**Palladium**—(Metallic), per lb...400.00
**Platinum**—(Metallic), per lb. ..128.00
**Potassium**—Metallic, per oz.. .. 2.00
**Rhodium**—(Metallic), per lb...512.00
**Ruthenium**—(Metallic), per oz. 112.00
**Rubidium**—(Metallic), per oz....200.00
**Selenium**—(Metallic), per oz... .. 3.00
**Sodium**—(Metallic) per lb .. .. 4.50
**Strontium**—(Metallic), per oz..128.00
**Tantallum**—(Metallic) per oz....144.00
**Telurium**—(Metallic) per oz.... 9 00
**Thallium**—(Metallic) per oz..... 3.00
**Titanium**—(Metallic) per oz....32.00
**Thorium**—(Metallic) per oz.....272.00
**Tungsten**—(Metallic) per lb..... 1.25
**Vanadium**—(Metallic), per oz. .320.00
**Yttrium**—(Metallic), per oz ....144 00
**Zirconium**—(Metallic), per oz..240.00

### METALS.

**Aluminum**—
Bronze (10 %), ℔ lb..... 46c.
**Copper**—
Lake Ingot, Spot, ℔ lb.... 17 75c.
Electrolytic, ℔ lb .... .... 16 50c.
Casting Brands, ℔ lb.... 16½c.
Chili Bars, London, ℔ ton £80
Sheet Copper (according to
size), ℔ lb..... .....25 @38c.
**Lead**—
Domestic, Common, Spot.. 3 80c.
Foreign ..... ..... 4 80c.
Sheet, ℔ lb, net ..... .. 7 00c. net
Pipe, ℔ lb .. ..... 6c. "
Tin lined Pipe, ℔ lb..... 14c. "
Shot, ℔ lb..... 6¾c
**Tin**—
Tin Plates..... ..... 14s. 9d.
Tin Spot in London . ..... £101 10s.
Pig tin, spot in N. Y., ℔ lb.. 23c.
**Zinc**—
Domestic spelter, ℔ lb.... .. 5 05c.
Foreign spelter, ℔ lb... ... 6c.
Silesian, ton..... ..... £19
Sheet, American, ℔ lb..... 6¾c.
**Antimony**—Hallet's, per lb.. 16½c.
Cookson's, per lb.... ..... .. 14c.
Star Antimony..... ..... £42 10s.
**Quicksilver**—Per lb..... 61@63c.
London, ℔ flask..... .....£7@£7¼

### IRON AND STEEL.
### New York Prices.

**American Pig-Iron.**—At tidewater.
No. 1 X.... . ..... ....$18.00@$18.50
No. 2 X..... ..... 17.00@ 17.50
Forge... .. ..... ... 16.00@.. ....
**Scotch Pig**—Coltness... 21.75@ 22 00
Clyde ..... @ 20.50
Dalmellington..... ..... @ 20.50
Summerlee..... 22.00@ 22.25
Shotts..... 21.00@ 21.50
Langloan ..... 21.00@ 21.50
*By Cable to-day to the Metal Exchange :*
Scotch Warrants.....41s. 6d.
Coltness, at Glasgow .... ..... .49s. 6d.
Langloan, at Glasgow.....49s. 0d.
Summerlee, at Glasgow.....50s. 6d.
Gartsherrie, at Glasgow.... ....47s. 3d.
Glengarnock, at Aidrossan. ....47s. 6d.
Dalmellington, at Ardrossan.....42s. 6d.
Eglinton, at Ardrossan .. .....41s. 6d.
**Bessemer Pig**—
Foreign, nominally..... $19.50@$20.00
Domestic ..... .....16@18.25
**Spiegeleisen**—
German, 20 per cent..... $26.00@$26.50
English, 20 " " ..... 27.00@ 27.50
" 30 " " ..... 31.50@ 32.00
Ferro Manganese, 80%.... 54.00@ 54.50
**Steel Blooms**, nominally ..... .....
**Steel Billets**, " .....@ .....
**Steel Nail Slabs**, " .....@ .....
**Steel Wire Rods**, " 39.75@ 40.00
**Steel Rails**—
Heavy sections, at mill....$28.00@ 28.50
Light " .... 30.00@ 34 00
**Structural Iron and Steel**—
Bridge Plate, at mill.. .....2·0 @2·1c.
Angles, at mill ..... 2·00@2·10c.
Tees, at mill..... .....2·40@2·50c.
Steel Angles, at mill.... ...2¼ @2½c.
Beams and Channels, on wharf, 3·3c. base
**Steel Plates**—
Tank and Ship, on wharf.....2·25@2·4
Shell, on wharf..... ....2·4 @2·6
Flange, " ..... 3¾ @3
Fire-Box, on wharf..... 3¼ @3½
**Iron Plates**—
Common tank, on wharf....2·1@2·2c.
Refined, on wharf.....2·3@2·4c.
Shell, " .....2·4@2½c.
Flange, " ..... 3·4@3·5
Extra flange, on flange.....3¾@4
**Bar Iron**—
Refined..... .....1·7 @1·9c.
Common ..... .....1·55@1·65c.
**Merchant Steel**—
American tool ..... ..... 8½@10c.
Special grades..... 13 @20c.
Crucible machinery..... 5 @6c
" spring..... .... .... 4½c.
Bessemer machinery..... ....2·2@2·5c
" spring. .. .... 2·7@2·9c.
**Cast-Iron Pipe**—At works:
According to size..... $25 00@$31.00
**Wrought-Iron Pipe**—nominally—
Butt-Welded, Plain and Tarred, 52½% disc; Galv., 45% disc.
Lap-Welded, Plain and Tarred, 62½% disc; Galv., 52½% disc.
**Boiler Tubes**—Per cent disc..60@62½%
**Rail Fastenings**—
Spikes..... .. .... 2·2@2·25c. delv'd
Angle Fish-bars..... .1·9 @2c.
Bolts and Sq Nuts.....2·9 @3c.
" Hex. " .....3·1 @
**Wrought Scrap**—
Foreign, *ex store*..... @
No. 1 Yard *to vessel*..... 20.50@ 21.00
**Cast Scrap** ..... .. 15.50@ 16.50
**Old Car Wheels**..... .... @
**Old Rails**—Tees .. .... 23.00@ 24.00
—Doubles ..... 24.00@ 25 00
**Nails**—In car-load lots. ... 1·85@1·90c.
—From store..... .... 1·95@ 2.00

### Louisville Prices.

**Hot Blast Irons**—
So. Coke, No. 1..... ....$17.50@$18.00
" " No. 2..... ..... 16 50@ 17.00
" " No. 2½ ..... .. 16.00@ 16.50
Mahoning Valley (Lake Ore Mixture) ..... .... 20.50@ 21.00
So. Charcoal, No. 1..... 18.00@ 18.50
" " No. 2..... 17.00@ 17.50
Missouri Charcoal No. 1.... 19.50@ 20.00
" " No. 2.... 19.00@ 19.50
**Forge Irons**—
Neutral Coke..... .....$14.75@$15.25
Cold Short ..... 14.25@ 14.75
Mottled..... ..... 12.75@ 13.75
**Car Wheel and Malleable Irons**—
Southern (standard brands).$22.00@$25.00
" (other brands)..... 18 00@ 18 50
Lake Superior..... .. 22.50@ 23.50

### Pittsburg Prices.

**Coke or Bituminous Pig**—
Foundry No. 1..... ..$17.75@18.00
Foundry No. 2..... .... .... 16.75@17.00
Gray Forge No. 3..... ..... 16.00@16.50
" " No. 4... .. .... 15.50@15.75
White ..... .. .... .... 15.00@15.50
Mottled..... ..... 15.25@15 50
Silvery ..... ..... .... 16.50@18.50
Bessemer..... ..... .... 17.50@17.75
Low Phos ..... .... .22.00
**Charcoal Pig**—
Foundry No. 1. ..... .. 23.50@24.50
Foundry No. 2..... . . 22.00@24.00
Cold-Blast..... ..... 25.00@27.00
Warm-Blast..... ..... 24.00@25.00
20 p. c. Spiegel..... ..... 27.00@27.50
Muck-Bar..... ... ..... 29.25@29.75
Steel Blooms..... ..... 29.00@29.25
Steel Slabs ..... .. .. 28.50@28.75
Steel Crop Ends.... ..... 19.50@20.00
Steel Bloom Ends..... .....@19.50
Ferro Manganese, 80%.. . .. 56.00@56.50
Steel Billets..... ..... 29.00@29.50
Old Iron Rails..... . . 24.50@25.00
Old Steel Rails..... .... 19.00@20 00
No. 1 W. Scrap..... ..... 20 00@21.00
No. 2 W. Scrap.. . ..... .. 18.50@19.50
Steel Rails..... .... .....*30.00@ ....
" light sections... .....*32.00@33.00
Bar Iron, nominal..... 1 75@ 1.80
Nails ..... .. .. $2.00 usual discount
Steel Nails..... .... .... .... .... $2.50
Two per cent off for cash. * At works.

### Philadelphia Prices.

Foundry No. 1..... $18.00@19.50
Foundry No. 2. ..... 17.00@18.00
Gray Forge..... 15.50@16.50
Bessemer Pig..... 19.50@20.50
Steel Rail Blooms..... 29.50 nom
Foreign Bessemer..... 19.50@20.50
Spiegeleisen. ..... 26.50@27.00
Scrap, Selected..... 22.00@23.00
No. 1..... ... .. .... 21.00@20.00
Cargo Scrap..... .. .... 21.00@21.50
Muck-Bars..... .. ..... . . .@30.50
Merchant Iron..... .. ... 1.75@ 1.95
Plate Iron..... ... 2.00@ 2.10
Tank Iron ..... ..... 2.00@ 2.15
Skelp Iron..... ..... 1.95@ 2.00
Angles..... ..... .. @ 2.10
Beams and Channels..... .. 3.30@.....
Nails ..... ... .. ..... 1.90@ 2.00
Steel Rails. ..... .... 28@29.50
Old Rails..... 23.50@24 00

## STOCK MARKET QUOTATIONS

### Baltimore, Md.

| Company. | Bid. | Asked. |
|---|---|---|
| Atlantic Coal.... | 1.40 | 1.75 |
| Balt. & N. C..... | .28@.27 | .28@.29 |
| Conrad Hill | .05 " | .15 |
| Diamond Tunnel | .40@.46 | .55 |
| George's Crk. C. | .... | 110.00 |
| Lake Chrome.. | .05 | .10 |
| N. State, Balto.. | .10@.25 | .28 |
| Ore Knob..... | .05 | .10 |
| Silver Valley.... | .80 | 1.00 |

Highest and lowest prices bid and asked during the week ending October 31st.

### Birmingham, Ala.

| Company. | Bid. | Asked. |
|---|---|---|
| Ala. Conn. C.. | .... | 25 |
| Bir. Min. & Mfg. | .... | 155 @175 |
| Bir. Fur. & Mg. | 10 | 16 @ 17 |
| Broken Arrow C. & M.. ... | .... | 12¾ |
| Decat. L. Imp. & Fur ... ... | 10 @11¼ | 11¼@ 11¾ |
| Decatur Min. L. | . . | 23 @ 25 |
| Enterprise Mfg. Co .... | .... | 50 |
| Jagger-Townley C & C. Co. | 5 | 11 |
| Mag-Ellen C. & Mg ..... | 70 @75 | 100 |
| No. Bus. Crk., C. & Mg..... | 3¾ | 4½@ 7½ |
| Sloss I. & S... | 25 @28 | 27½@ 30 |
| * Sloss I. & S.. | 86 @86½ | 86 @ 87½ |
| Sheffield C. & I. | 64½ | 66¼@ 68 |
| Tenn. C. & I. Co. | 29 | 31 @ 32 |
| *Williamson Iron Co... . | 99¾ | .... |
| Woodstock S. & I | 51½@56½ | 58 @ 59 |

* Bonds.

Highest and lowest prices bid and asked during the week ending October 31st.

### Pittsburg, Pa.

| Company. | H. | L. | Closing. |
|---|---|---|---|
| Allegheny Gas.... | 35.00 | 35.00 | 35.00 |
| Bridgewater Gas. | 40.00 | 30.00 | 30.00 |
| Charlotte Mining. | 5.00 | 5.00 | 5.00 |
| Chartiers Val. Gas. | 50.00 | 50.00 | 50.00 |
| Columbia Oil Co.. | 4.25 | 3.75 | 3 75 |
| La Noria Mining .. | 1.75 | 1.38 | 1.75 |
| M'f'turers' Gas.... | 20.00 | 20.00 | 20.00 |
| N. Y. & C. Gas Coal. | 32.00 | 32.00 | 32.00 |
| Philadelphia Co... | 40.63 | 40.50 | 40.63 |
| Pittsburg Gas ... | 65.00 | 65.00 | 65.00 |
| Silverton Mg. Co.. | 1.50 | 1.50 | 1.50 |
| Tuna Oil Co ... . | 63 50 | 60.00 | 63.50 |
| Washington Oil... | 70.00 | 65 00 | 70.00 |
| Wheeling Gas ... | 27.00 | 25.00 | 25.00 |
| Yankee Girl Mg.. | 5.00 | 5.00 | 5.00 |

Highest and lowest prices bid and asked during the week ending October 31st.

### Foreign Quotations.

| Company. | *London.* Highest. | October 13. Lowest. |
|---|---|---|
| Alturas Gold, Idaho... | 6s. 6d. | 5s. 6d. |
| Arizona Copper, Ariz.. | 18s. 6d. | 18s. |
| Birdseye Creek, Cal.. .. | 6s. | 5s. |
| Carlisle, N. Mex .... | 15s. | 14s. |
| Colorado United, Colo.. | 5s. | 2s. 6d. |
| Columbian, S. A..... | £1 15-16 | £1 13-16 |
| Cons. Esmeralda, Nev.. | 7s. | 6s. |
| Denver Gold, Colo.... | 1s. 9d. | 1s. 3d. |
| Dickens Custer, Idaho. | 5s. 6d. | 4s. 6d. |
| Eberhardt, Nev ..... | 2s. | 1s. 6d. |
| El Callao, Venezuela.... | £2¾ | £2½ |
| Empire, Mont ... ..... | £1¼ | £1⅛ |
| Flagstaff, Utah..... | 4s. | 3s. |
| Garfield, Nev... ..... | 16s. | 15s. |
| Gold Hill, N. C..... | 1s 9d. | 1s. 3d. |
| Ilex, Cal..... ..... | £⅝ | £⅜ |
| Josephine, Cal ..... | 8s. 9d. | 6s. 3d. |
| Kohinoor, Colo..... | 2s. 9d. | 2s. 3d. |
| Mason & Barry, Portugal | £11⅛ | £11¼ |
| Montana Lt., Mont .... | £2 | £1⅞ |
| New California, Colo... | 9s. 3d. | 8s 9d. |
| New Emma, S., Utah... | 5s 9d. | 5s. 3d. |
| New Hoover Hill, N. C. | 2s. 3d. | 1s. 9d. |
| New La Plata, Colo... | 2s. 6d. | 2s. |
| Pittsburg Cons.. Nev... | 21s. 3d. | 18s. 9d. |
| Quebrada, Venezuela... | £6 1-16 | £5 15-16 |
| Richmond Con., Nev... | £3¼ | £3 |
| Ruby & Dunderberg, Nev | 2s. 6d. | 2s. |
| Russell Gold, N. C..... | 4s. | 3s. |
| Sierra Buttes, Cal.... | £⅝ | £¼ |
| Stanly, N. C..... ..... | 7s. 6d | 5s. |
| Tolima, Colombia, S.A. | £2⅛ | £1⅞ |
| U. S. Placer, Colo..... | 9s. | 8s. |
| Viola Lt., Idaho ..... | 20s. | 18s. |

| | *Par's.** | October 11. |
|---|---|---|
| El Callao..... ..... | 75.60 | 75.60 |
| Golden River.... .. .. | 405 | 405 |
| Lexington. ..... | 100.59 | 100.59 |
| " parts..... . | 4.50 | 4 50 |
| Rio Tinto..... | 597.50 | 597.50 |
| " obligations... | 516.25 | 516.25 |
| " " | 2d. 507.50 | 507.50 |
| Tharsis ..... | 160.00 | 160.00 |

* Francs.

## DIVIDEND-PAYING MINES.

| | Name and Location of Company. | | Capital Stock. | Shares. No. | Shares. Par | Assessments. Total levied. | Assessments. Date and amount of last. | | | Dividends. Total paid. | Dividends. Date and amount of last. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Adams, d. L. | Colo. | $1,500,000 | 150,000 | $10 | * | ..... | ..... | ..... | $555,000 | Jan. | .15 |
| 2 | Alice, S. C. | Mont | 10,000,000 | 400,000 | 25 | * | ..... | ..... | ..... | 750,000 | Sept | .06¼ |
| 3 | Alturas, G. | Idah. | 1,500,000 | 300,000 | 5 | ..... | ..... | ..... | ..... | 95,000 | Sept | .50 |
| 4 | Amy & Silversmith, S. | Mon. | ..... | 341,419 | ..... | ..... | ..... | ..... | ..... | 247,530 | Aug. | .12½ |
| 5 | Atlantic, C. | Mich | 1,000,000 | 40,000 | 25 | $280,000 | Apl. | 1875 | $1.00 | 480,000 | Aug. | 1.50 |
| 6 | Argenta, S. | Nev. | 10,000,000 | 100,000 | 100 | 325,000 | July | 1885 | .10 | 40,000 | Feb. | .20 |
| 7 | Aurora, L. | Mich | 2,000,000 | 100,000 | 20 | * | ..... | ..... | ..... | 155,000 | Oct. | 1.87½ |
| 8 | Bassick, G. S. | Colo. | 10,000,000 | 100,000 | 100 | * | ..... | ..... | ..... | 400,000 | Mar. | 1.00 |
| 9 | Belle Isle, S. | Nev. | 10,000,000 | 100,000 | 100 | 145,000 | Feb | 1887 | .20 | 300,00 | ... | .25 |
| 10 | Belcher, G. S. | Nev. | 10,400,000 | 104,000 | 100 | 2,770,000 | Sept | 1888 | .50 | 15,397,200 | Apl | 1876 |
| 11 | Bellevue Idaho, S. L. | Idah. | 1,250,000 | 125,000 | 10 | 57,500 | Nov. | 1887 | 25 | 187,500 | Jan | 1887 |
| 12 | Black Bear, G. | Cal. | 3,000,000 | 60,000 | 50 | 32,500 | Dec. | 1884 | .25 | 895,000 | May | 1883 |
| 13 | Sodie Con., G. S. | Cal. | 10,000,000 | 100,000 | 100 | 500,000 | Sept | 1883 | .50 | 1,295,000 | Apl. | 1885 |
| 14 | Bonanza Developm't | C & M | 3,000,000 | 300,000 | 10 | * | ..... | ..... | ..... | 135,00 | Oct. | 1882 |
| 15 | Bonanza K'g, Cons. | Cal. | 1,000,000 | 100,000 | 10 | * | ..... | ..... | ..... | 185,000 | Feb. | .10 |
| 16 | Boston & Mont, G. | Mon | 2,500,000 | 250,000 | 10 | * | ..... | ..... | ..... | 520,000 | Jun. | .10 |
| 17 | Boston & Mont., C. | Mon | 2,500,000 | 100,000 | 25 | * | ..... | ..... | ..... | 400,000 | Nov. | 1888 |
| 18 | Breece, S. | Colo. | 600,000 | 300,000 | 25 | * | ..... | ..... | ..... | 2,000 | Feb. | 1880 |
| 19 | Brooklyn Lead, L. S. | Utah | 3,000,000 | 300,000 | 10 | ..... | ..... | ..... | ..... | 270,000 | May | 1884 |
| 20 | Bulwer, G. | Cal. | 10,000,000 | 100,000 | 10 | 80,000 | May | 1888 | .20 | 175,000 | Jan. | 1884 |
| 21 | Caledonia, G. | Dak. | 10,000,000 | 100,000 | 100 | 505,000 | May | 1885 | .15 | 40,000 | Feb. | 1886 |
| 22 | Calumet & Hecla, C. | Mich | 2,500,000 | 100,000 | 25 | 1,200,000 | ..... | ..... | ..... | 30,850,000 | Sept | 1888 |
| 23 | Carbonate Hill, S. L. | Colo. | 2,000,000 | 200,000 | 10 | * | ..... | ..... | ..... | 80,000 | Apl. | 1884 |
| 24 | Caribou Con., S. | Colo. | 1,500,000 | 150,000 | 10 | * | ..... | ..... | ..... | 50,000 | Mch | 1880 |
| 25 | Castle Creek, G. | Idah. | 100,000 | 100,000 | 1 | * | ..... | ..... | ..... | 51,000 | Oct. | 1883 |
| 26 | Catalpa, S. L. | Colo. | 3,000,000 | 300,000 | 10 | * | ..... | ..... | ..... | 270,000 | May | 1884 |
| 27 | Central, C. | Mich | 500,000 | 20,000 | 25 | 100,000 | Sept | 1861 | .06 | 1,890,000 | Aug. | 1888 |
| 28 | Christy, S. | Utah | 10,000,000 | 100,000 | 100 | ..... | ..... | ..... | ..... | 10,000 | Jun. | 1885 |
| 29 | Chrysolite, S. L. | Colo. | 10,000,000 | 200,000 | 50 | * | ..... | ..... | ..... | 1,650,000 | Dec. | 1884 |
| 30 | Colorado Central, S. L. | Colo. | 2,750,000 | 275,000 | 10 | * | ..... | ..... | ..... | 337,500 | Oct. | 1888 |
| 31 | Confidence, S. L. | Nev. | ..... | 24,960 | ..... | 287,440 | Apl. | 1887 | .50 | 174,720 | Aug. | 1888 |
| 32 | Cons. Cal. & Va., G. S. | Nev. | 21 600,000 | 216,000 | 100 | 108,000 | Jan. | 1885 | .20 | 2,327,800 | Oct. | 1888 |
| 33 | Contention, S. | Ariz. | 12,500,000 | 250,000 | 50 | ..... | ..... | ..... | ..... | 1,587,000 | Dec. | 1884 |
| 34 | **Cop. Queen Cons, C. | Ariz. | 1,400 000 | 140,000 | 10 | ..... | ..... | ..... | ..... | 140,000 | Oct | 1888 |
| 35 | Crescent, S. L. G. | Utah | 15,000,000 | 600,000 | 25 | * | ..... | ..... | ..... | 228,000 | Oct. | 1888 |
| 36 | Crown Point, G. S. | Nev. | 10,000,000 | 100,000 | 100 | 2,825,000 | Oct. | 1888 | .50 | 11,588,000 | Jan. | 1875 |
| 37 | Daly, S. L. | Utah | 3,000,000 | 150,000 | 20 | ..... | ..... | ..... | ..... | 787,500 | Oct. | 1888 |
| 38 | Deadwood Terra, S. L. | Dak. | 5,000,000 | 200,000 | 25 | * | ..... | ..... | ..... | 1,400,000 | Nov. | 1887 |
| 39 | Derbec & Grav., G. S. | Cal. | 10,000,000 | 100,000 | 100 | 90,000 | Dec. | 1881 | .10 | 180,000 | May | 1887 |
| 40 | Dunkin, S. L. | Colo. | 5,000,000 | 200 000 | 25 | * | ..... | ..... | ..... | 345,000 | Oct. | 1888 |
| 41 | Eclipse | Colo. | 100,000 | 100,000 | 1 | ..... | ..... | ..... | ..... | 20,000 | Nov. | 1887 |
| 42 | Elkhorn, G. S. | Mont | 1,000,000 | 100,000 | 10 | 50,0 0 | July | 1883 | .50 | 170,900 | July | 1887 |
| 43 | Empire Lt., G. | Mont | 500,000 | 100,000 | 5 | ..... | ..... | ..... | ..... | 70,500 | Oct. | 1887 |
| 44 | Eureka Con., G. S. L. | Nev. | 5,000,000 | 50,000 | 100 | 500,000 | July | 1886 | 1.00 | 4,918,500 | July | 1888 |
| 45 | Evening Star, S. L. | Colo. | 500,000 | 50,000 | 10 | * | ..... | ..... | ..... | 1,400,000 | Nov. | 1883 |
| 46 | Excelsior, G. | Cal. | 10,000,000 | 100,000 | 100 | 560,000 | Sept | 1885 | 1.00 | 875,000 | Oct. | 1880 |
| 47 | Father de Smet, G. | Dak. | 10,000,000 | 100 000 | 100 | 200,000 | Nov | 1878 | 1.00 | 1,125,000 | Dec. | 1885 |
| 48 | Franklin, C. | Mich | 1,000,000 | 40,000 | 25 | 220,000 | Jun. | 1871 | .... | 720,000 | July | 1888 |
| 49 | Freeland, G. S. C. | Colo. | 5,000,000 | 200,000 | 25 | * | ..... | ..... | ..... | 190,000 | July | 1886 |
| 50 | Fresno Enterprise, G. | Cal. | 5,000,000 | 100,000 | 50 | ..... | ..... | Mch | 1883 | .10 | 110,000 | July |
| 51 | Garfield Lt., G. S. | Nev. | 500,000 | 100,000 | 5 | ..... | ..... | ..... | ..... | 85,000 | Apl. | 1888 |
| 52 | Golconda, G. S. | Idah. | 1,000,000 | 100,000 | 10 | ..... | ..... | ..... | ..... | 120,000 | May | 1888 |
| 53 | Gould & Curry, G. S. | Nev. | 10,800,000 | 108,000 | 100 | 5,355,000 | Oct. | 1888 | .50 | 3,826,800 | Oct. | 1870 |
| 54 | Grand Central, S. | Ariz. | 1,000,000 | 100,000 | 10 | ..... | ..... | ..... | ..... | 625,000 | Dec. | 1882 |
| 55 | Grand Prize, S. | Nev. | 10,000,000 | 100,000 | 100 | 595,000 | Oct. | 1888 | .25 | 495,000 | Mar. | 1884 |
| 56 | Granite, S. | Colo. | 125,000 | 125,000 | 1 | ..... | ..... | ..... | ..... | 6,250 | May | 1883 |
| 57 | Granite Mountain, S. | Mont | 10,000,000 | 400,000 | 25 | * | ..... | ..... | ..... | 5,200,000 | Oct. | 1888 |
| 58 | Green Mountain, G. | Cal. | 1,250,000 | 125,000 | 10 | * | ..... | ..... | ..... | 212,000 | Nov. | 1881 |
| 59 | Hale & Norcross, G. & | Nev. | 11,200,000 | 112,000 | 100 | 5,088,000 | July | 1887 | .50 | 1,832,000 | Aug. | 1888 |
| 60 | Hall-Anderson, G. | N. S. | 150,000 | 150,000 | 1 | ..... | ..... | ..... | ..... | 7,000 | Jan. | 1882 |
| 61 | Hecla Con., S. G. L. C. | Mont | 1,500,000 | 30,000 | 50 | * | ..... | ..... | ..... | 1,197,500 | Aug. | 1888 |
| 62 | Hel'a Mg & Red, G. & L. | Mont | 3,315,000 | 663,000 | 5 | * | ..... | ..... | ..... | 197,973 | July | 1886 |
| 63 | Holmes, S. | Nev. | 10,000,000 | 100,000 | 9 | 300,000 | Sept | 1885 | 10 | 75,000 | Apl. | 1886 |
| 64 | Holyoke, G. | Idah. | 200,000 | 200,000 | 1 | ..... | ..... | ..... | ..... | 27 000 | Feb. | 1883 |
| 65 | Homestake, G. | Dak. | 12,500,000 | 125,000 | 100 | 300,000 | July | 1878 | 1.00 | 4,243,750 | Oct. | 1888 |
| 66 | Honorine, S. L. | Utah | 500,000 | 250,000 | 2 | 25,000 | Jun. | 1883 | .... | 125,000 | Sept | 1887 |
| 67 | Hope, S. | Mont | 1,000,000 | 100,000 | 10 | * | ..... | ..... | ..... | 233,252 | Apl. | 1883 |
| 68 | Horn-Silver, S. L. | Utah | 10,000,000 | 400,000 | 25 | * | ..... | ..... | ..... | 4,000,000 | Nov. | 1884 |
| 69 | Hubert, G. | Colo. | 500,000 | 50,000 | 10 | * | ..... | ..... | ..... | 239,500 | Oct. | 1888 |
| 70 | Idaho, G. | Cal. | 310,000 | 3,100 | 100 | ..... | ..... | ..... | ..... | 4,966,750 | Sept | 1888 |
| 71 | Ideal, S. L. | Colo. | 1,500,000 | 50,000 | 10 | * | ..... | ..... | ..... | 15,000 | Oct. | 1886 |
| 72 | Illinois, G. | N. M. | 100,000 | 100,000 | 1 | ..... | ..... | ..... | ..... | 25,000 | Jan. | 1887 |
| 73 | Independence, S. | Nev. | 10,000,000 | 100,000 | 100 | 340,000 | Oct. | 1886 | .20 | 225,000 | Sept | 1879 |
| 74 | Indian Queen, S. | Nev. | 250,000 | 125,000 | 2 | * | ..... | ..... | ..... | 368,750 | July | 1883 |
| 75 | Iron Hill, S. | Dak. | 2,500,000 | 250,000 | 10 | 118,750 | Sept | 1888 | .03 | 156,250 | Nov. | 1887 |
| 76 | Iron-Silver, S. L. | Colo. | 10,000,000 | 500,000 | 20 | * | ..... | ..... | ..... | 2,300,000 | July | 1888 |
| 77 | Jackson, G. S. | Nev. | 5,000,000 | 50,000 | 100 | 10,000 | Nov | 1880 | .20 | 45,000 | Oct. | 1886 |
| 78 | Jay Gould | Mont | 2,000,000 | 40,000 | 5 | * | ..... | ..... | ..... | 267,000 | Jun. | 1888 |
| 79 | Jocusitita, S. | Mex. | 2,500,000 | 250,000 | 10 | ..... | ..... | ..... | ..... | 1,200,000 | Feb. | 1886 |
| 80 | Jumbo, G. | Colo. | 2,000,000 | 200,000 | 10 | * | ..... | ..... | ..... | 35,000 | Oct. | 1887 |
| 81 | Kentuck | Nev. | 3,000,000 | 30,000 | 100 | 342,000 | Nov | 1881 | .30 | 1,350,000 | Dec. | 1886 |
| 82 | La Plata, S. L. | Colo. | 2,000,000 | 200,000 | 10 | * | ..... | ..... | ..... | 610,000 | Sept | 1882 |
| 83 | Leadville Cons., S. L. | Colo. | 4,000,000 | 400,000 | 10 | * | ..... | ..... | ..... | 423,000 | Apl. | 1887 |
| 84 | Lexington, G. S. | Mont | 4,000,000 | 40,000 | 100 | * | ..... | ..... | ..... | 565,000 | Jan. | 1885 |
| 85 | Little Chief, S. L. | Colo. | 10,000,000 | 200,000 | 50 | * | ..... | ..... | ..... | 800,000 | July | 1888 |
| 86 | Little Pittsburg, S. L. | Colo. | 20,000,000 | 200,000 | 100 | * | ..... | ..... | ..... | 1,050,000 | Mch. | 1880 |
| 87 | Manhattan, S. | Nev | 5,000,000 | 50,000 | 100 | 250,000 | Dec. | 1887 | 1.00 | 437,500 | Feb | 1886 |
| 88 | Marion Bullion, G. | N.C. | 500,000 | ..... | ..... | ..... | ..... | ..... | ..... | 15,000 | Jan. | 1886 |
| 89 | Martin White, S. | Nev. | 10,000,000 | 100,000 | 100 | 1,150,000 | Mar. | 1886 | 25 | 140,000 | Dec. | 1886 |
| 90 | Mary Murphy, G. S. | Colo. | 350,000 | 3,500 | 100 | * | ..... | ..... | ..... | 122,500 | Feb. | 1888 |
| 91 | Minnesota, C. | Mich | 1,000,000 | 40,000 | 25 | 420,000 | Apl. | 1886 | 1 00 | 1,826,000 | Mar. | 1876 |
| 92 | Mono, G. | Cal. | 5,000,000 | 50,000 | 100 | 641,000 | Sept | 1888 | .50 | 12,500 | Mar. | 1886 |
| 93 | Montana, L. & S. | Mont | 1,300,000 | 260,000 | 5 | * | ..... | ..... | ..... | 2,145,035 | Oct. | 1888 |
| 94 | Morning Star, S. L. | Colo. | 1,000,000 | 100,000 | 10 | * | ..... | ..... | ..... | 775,000 | Mar. | 1888 |
| 95 | Moulton, S. G. | Mont | 2,000,000 | 400,000 | 5 | * | ..... | ..... | ..... | 330,000 | Dec. | 1887 |
| 96 | Mount Pleasant, G. | Cal. | 150,000 | 150,000 | 1 | * | ..... | ..... | ..... | 150,000 | Feb. | 1887 |
| 97 | Mt. Diablo, S. | Nev. | 5,000,000 | 50,000 | 100 | 137,500 | Jun. | 1880 | 2.00 | 120,000 | Aug. | 1888 |
| 98 | Napa, Q. | Cal. | 700,000 | 100,000 | 7 | ..... | ..... | ..... | ..... | 280,000 | Jan. | 1883 |
| 99 | Navajo, G. S. | Nev. | 10,000,000 | 100,000 | 100 | 485,000 | Apl. | 1888 | .30 | 335,000 | Feb. | 1885 |
| 100 | N. Hoover Hill, G. S. | N. C. | 300,000 | 120,000 | 2½ | * | ..... | ..... | ..... | 30,000 | Dec. | 1883 |
| 101 | Northern Belle, S. | Nev. | 5,000,000 | 50,000 | 100 | 425,000 | Jan. | 1884 | 8.30 | 2,400,000 | Apl. | 1883 |
| 102 | North Belle Isle, S. | Nev. | 10,000,000 | 100,000 | 100 | 300,000 | Oct | 1888 | .50 | 230,000 | May | 1888 |
| 103 | Ontario, S. L. | Utah | 15,000,000 | 150,000 | 100 | ..... | ..... | ..... | ..... | 9,575,000 | Oct. | 1888 |
| 104 | Opnir, G. S. | Nev. | 10,000,000 | 100,000 | 100 | 4,109,440 | Sept | 1888 | .50 | 1,565,800 | July | 1882 |
| 105 | Original, S. C. | Mont | 1,500,000 | 60,000 | 25 | * | ..... | ..... | ..... | 120,000 | Apl. | 1888 |
| 106 | Osceola, C. | Mich | 1,250,000 | 50,000 | 25 | 480,000 | Apl. | 1876 | 1.60 | 1,172,500 | Sept | 1888 |
| 107 | Oxford, G. S. | N. S. | 125,000 | 125,000 | 1 | * | ..... | ..... | ..... | 34,500 | Oct. | 1885 |
| 108 | Paradise Valley, G. S. | Nev. | 10,000,000 | 100,000 | 100 | 62,000 | Apl. | 1888 | .15 | 150,000 | Apl. | 1887 |
| 109 | Parrott, C. | Mont | 1,800,000 | 180,000 | 10 | ..... | ..... | ..... | ..... | 246,000 | Oct. | 1888 |
| 110 | Peacock, S. G. C. | N.M. | 2,000,000 | 200,000 | 10 | * | ..... | ..... | ..... | 60,000 | Nov. | 1886 |
| 111 | Pleasant Valley, G. S. | Cal. | 10,000,000 | 100,000 | 100 | 10,000 | Mar. | 1884 | .10 | 30,000 | Dec. | 1882 |
| 112 | Plutus, G. S. C. L. | Colo. | 2,000,000 | 200,000 | 10 | * | ..... | ..... | ..... | 20,000 | Feb. | 1886 |
| 113 | Plymouth Con., G. | Cal. | 5,000,000 | 100,000 | 50 | * | ..... | ..... | ..... | 2,280,000 | Feb. | 1888 |
| 114 | Prussian, S. L. | Colo. | 1,500,000 | 150,000 | 10 | ..... | ..... | ..... | ..... | 180,000 | Jan. | 1883 |
| 115 | Quicksilver, pref., Q. | Cal. | 4,300,000 | 43,000 | 100 | ..... | ..... | ..... | ..... | 1,471,442 | Oct. | 1888 |
| 116 | " com., Q. | Cal. | 5,700,000 | 57,000 | 100 | ..... | ..... | ..... | ..... | 151,000 | July | 1882 |
| 117 | Quincy, C. | Mich | 1,000,000 | 40,000 | 25 | 200,000 | Dec. | 1862 | ..... | 4,970,000 | Aug. | 1888 |
| 118 | Richmond, S. L. | Nev. | 1,350,000 | 54,000 | 25 | * | ..... | ..... | ..... | 4,312,587 | Jun. | 1887 |
| 119 | Ridge, C. | Mich. | 500,000 | 20,000 | 25 | 219,939 | Mar | 1886 | .50 | 99,785 | Feb. | 1880 |
| 120 | Rising Sun, S. | Dak. | 750,000 | 250,000 | 5 | * | ..... | ..... | ..... | 52,000 | May | 1881 |
| 121 | Robinson Con., S. L. | Colo. | 10,000,000 | 200,000 | 50 | * | ..... | ..... | ..... | 585,000 | Mar. | 1886 |
| 122 | Robert E. Lee, S. L. | Colo | 10,000,000 | 500,000 | 20 | * | ..... | ..... | ..... | 100,000 | Dec. | 1882 |
| 123 | Rooks, G. | Vt. | 500,000 | 50,000 | 10 | * | ..... | ..... | ..... | 61,000 | Apr | 1885 |
| 124 | Savage, S. | Nev. | 11,200,000 | 112,000 | 100 | 6,436,000 | Oct. | 1888 | .50 | 4,460,000 | July | 1889 |
| 125 | Security L. Mg., Mfg. | Colo. | 1,000,000 | 100,000 | 10 | * | ..... | ..... | ..... | 50,000 | July | 1884 |
| 126 | Shoshone, G. | Idah. | 150,000 | 150,000 | 1 | ..... | ..... | ..... | ..... | 7,500 | Apl. | 1883 |
| 127 | Sierra Buttes, G. | Cal. | 2,325,000 | 232,500 | 10 | ..... | ..... | ..... | ..... | 1,492,557 | Apl. | 1888 |
| 128 | Sierra Nevada, G. S. | Nev. | 10,000,000 | 100,000 | 100 | 6,125,000 | July | 1888 | .25 | 102,000 | Jan. | 1871 |
| 129 | Sierra Nevada, S. L. | Idaho | 1,000,000 | 1 | 1 | * | ..... | ..... | ..... | 20,000 | June | 1888 |
| 130 | Silver Cord, G. S. L. | Colo. | 5,000,000 | 500,000 | 10 | ..... | ..... | ..... | ..... | 225,000 | Nov. | 1883 |
| 131 | Silver King, S. | Ariz. | 10,000,000 | 100,000 | 100 | 50,000 | Jun. | 1888 | .50 | 1,950,000 | July | 1887 |
| 132 | Silver Mg. of L. V. | N. M. | 500,000 | 500,000 | 1 | * | ..... | ..... | ..... | 25,000 | June | 1888 |
| 133 | Silverton, G. S. L. | Colo. | 2,000,000 | 200,000 | 10 | * | ..... | ..... | ..... | 80,000 | Nov. | 1886 |
| 134 | Small Hopes Cons., S. | Colo. | 5,000,000 | 250,000 | 20 | * | ..... | ..... | ..... | 3,112,500 | Dec. | 1887 |
| 135 | Smuggler, S. L. | Colo. | 600,000 | 60,000 | 10 | ..... | ..... | ..... | ..... | 365,700 | Aug. | 1883 |
| 136 | Spring Valley, G. | Cal. | 200,000 | 200,000 | 1 | 50,000 | Oct. | 1886 | .25 | 50,000 | Jan | 1881 |
| 137 | Standard, G. S. | Cal. | 10 000,000 | 100,000 | 100 | 25,000 | Oct. | 1884 | .25 | 8,595,000 | Jun. | 1888 |
| 138 | Stormont, S. | Utah | 500,000 | 500,000 | 1 | * | ..... | ..... | ..... | 155,000 | Nov | 1881 |
| 139 | St. Joseph, L. | Mo. | 1,500,000 | 150,000 | 10 | * | ..... | ..... | ..... | 844,000 | Dec | 1887 |
| 140 | Surinam, G. | D. G. | 3,000,000 | 600,000 | 5 | * | ..... | ..... | ..... | 105,000 | Nov | 1887 |
| 141 | Swansea, G. | Colo. | 650,000 | 65,000 | 10 | ..... | ..... | ..... | ..... | 9,000 | Apl. | 1888 |
| 142 | Syndicate, G. | Cal. | 10,000,000 | 100,000 | 100 | 38,729 | July | 1882 | .15 | 48,308 | Sept | 1886 |
| 143 | Tamarack, C. | Mich. | 1,000,000 | 40,000 | 25 | 520,000 | Apl. | 1885 | 3.00 | 440,000 | Oct. | 1888 |
| 144 | Tip Top, S. | Ariz. | 10,000,000 | 100,000 | 100 | 250,000 | Sept | 1883 | .25 | 100,000 | Nov. | 1881 |
| 145 | Tombstone, G. S. L. | Ariz. | 12,500,000 | 500,000 | 25 | * | ..... | ..... | ..... | 1,250,000 | Apl. | 1882 |
| 146 | United Verde, C. | Ariz. | 3,000,000 | 300,000 | 10 | * | ..... | ..... | ..... | 97,500 | Feb. | 1884 |
| 147 | Valencia, M. | N. H. | 150,000 | 1,500 | 100 | * | ..... | ..... | ..... | 37,500 | Apl | 1886 |
| 148 | Viola Lt., S. L. | Idah. | 750,000 | 150,000 | 5 | * | ..... | ..... | ..... | 222,500 | Dec. | 1887 |
| 149 | Yankee Girl | Colo. | 2,500,000 | 250,000 | 10 | * | ..... | ..... | ..... | 1,275,000 | July | 1887 |
| 150 | Yellow Jacket, G. S. | Nev. | 12,000,000 | 120,000 | 100 | 5,448,000 | Dec | 1885 | .75 | 2,184,000 | Aug | 1871 |

## NON-DIVIDEND-PAYING MINES.

| | Name and Location of Company. | | Capital Stock. | Shares. No. | Shares. Par Value. | Assessments. Total levied. | Assessments. Date & am't of last. | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Agassis Cons., S. L. | Colo. | $2,500,000 | 50,000 | $50 | * | ..... | ..... | ..... | |
| 2 | Alloues, C. | Mich | 2,000,000 | 80,000 | 25 | $657.000 | Jun | 1888 | 1.00 | |
| 3 | Alpha Con., G. S. | Nev. | 3,000,000 | 30,000 | 100 | 536,250 | Jan. | 1888 | 87½ | |
| 4 | Alta, S. | Nev. | 10,080,000 | 100,800 | 100 | 2,241,600 | Sept | 1888 | .50 | |
| 5 | Amador, G. | Cal. | 400,000 | 200,000 | 2 | * | ..... | ..... | ..... | |
| 6 | American Flag, S. | Colo. | 1,250,000 | 125,000 | 10 | 300,000 | Jun | 1877 | .50 | |
| 7 | Angio-Montana, Lt. | Mon. | 600,000 | 120,000 | 5 | ..... | ..... | ..... | ..... | |
| 8 | Appalachian, Lt., G. | N. C. | 1,500,000 | 300,000 | 5 | ..... | ..... | ..... | ..... | |
| 9 | Aspen Mg. & S., S. L. | Colo | 2,000,000 | 200,000 | 10 | * | ..... | ..... | ..... | |
| 10 | Barcelona, G. | Nev. | 5,000,000 | 200,000 | 25 | ..... | ..... | ..... | ..... | |
| 11 | Bechtel Con., G. | Cal. | 10,000,000 | 100,000 | 100 | 173,500 | Jan. | 1883 | .10 | |
| 12 | Belmont, S. | Nev. | 5,000,000 | 50,000 | 100 | 735,000 | Apl. | 1888 | .10 | |
| 13 | Beat & Belcher, G. S. | Nev. | 10,080,000 | 100,800 | 100 | 2,054,580 | Oct. | 1888 | .25 | |
| 14 | Big Pittsburg, S. L. | Colo. | 20,000,000 | 200,000 | 100 | * | ..... | ..... | ..... | |
| 15 | Bi-Metallic, S. | Mon. | 5,000,000 | 200,000 | 25 | * | ..... | ..... | ..... | |
| 16 | Black Oak, G. | Cal. | 3,000,000 | 300,000 | 10 | * | ..... | ..... | ..... | |
| 17 | Boston Con., G. | Cal. | 10,000,000 | 100,000 | 100 | 170,000 | Nov | 1883 | .25 | |
| 18 | Bremen, S. | N. M. | 5,000,000 | 500,000 | 10 | * | ..... | ..... | ..... | |
| 19 | Brunswick, G. | Cal. | 2,000,000 | 200,000 | 5 | * | ..... | ..... | ..... | |
| 20 | Bullion, G. S. | Nev. | 10,000,000 | 100,000 | 100 | 4,007,000 | Aug. | 1888 | .50 | |
| 21 | Bye and Bye | Ariz. | 1,000,000 | 100,000 | 10 | * | ..... | ..... | ..... | |
| 22 | Calaveras, G. | Cal. | 500,000 | 500,000 | 1 | * | ..... | ..... | ..... | |
| 23 | Carisa, G. | Wy | 500,000 | 100,000 | 5 | * | ..... | ..... | ..... | |
| 24 | Carupano, G. S. L. C. | Ven. | 400,000 | 100,000 | 2 | * | ..... | ..... | ..... | |
| 25 | Cashier, G. | Colo. | 500,000 | 250,000 | 2 | * | ..... | ..... | ..... | |
| 26 | Cen. Contin't, G. S. L. | C. & A | 2,000,000 | 200,000 | 10 | * | ..... | ..... | ..... | |
| | aries Dickens, G. S. | Idah. | 1,250,000 | 250,000 | 5 | * | ..... | ..... | ..... | |
| 28 | Cherokee, G. | Cal. | 1,500,000 | 150,000 | 10 | ..... | ..... | ..... | ..... | |
| 29 | Chollar, S. | Nev. | 11,200,000 | 112,000 | 100 | 1,320,000 | Oct. | 1888 | .50 | |
| 30 | Cinnamon Mt., G. S. | Colo | 750,000 | 150,000 | 5 | * | ..... | ..... | ..... | |
| 31 | Cleveland, T. | Dak. | 1,000,000 | 500,000 | 2 | * | ..... | ..... | ..... | |
| 32 | Clonebeck, G. S. | Nev. | 10,000,000 | 100,000 | 100 | 30 000 | Mar. | 1887 | .15 | |
| 33 | Con. Imperial, G. S. | Nev. | 5,000,000 | 50,000 | 100 | 1,175,000 | Sept | 1887 | .25 | |
| 34 | Con. Pacific, G. | Cal. | 6,000 000 | 60,000 | 100 | 177,000 | Sept | 1887 | .10 | |
| 35 | Cons. Silver, S. | Mo. | 2,500,000 | 250,000 | 10 | ..... | ..... | ..... | ..... | |
| 36 | Courtlandt | Colo. | 500,000 | 50,000 | 10 | ..... | ..... | ..... | ..... | |
| 37 | Crescent, S. L. | Colo. | 3,000,000 | 300,000 | 10 | ..... | ..... | ..... | ..... | |
| 38 | Crocker, S. | Ariz. | 10,000,000 | 100,000 | 100 | 105,000 | Feb. | 1888 | .20 | |
| 39 | Crowell, G. | N. C. | 500,000 | 500,000 | 1 | * | ..... | ..... | ..... | |
| 40 | Dahlonega, G. | Ga. | 250,000 | 250,000 | 1 | ..... | ..... | ..... | ..... | |
| 41 | Dandy, S. | Colo. | 5,000,000 | 500,000 | 10 | * | ..... | ..... | ..... | |
| 42 | Dardanelles, G. | Cal. | 1,000,000 | 100,000 | 10 | ..... | ..... | ..... | ..... | |
| 43 | Decatur, S. | Colo. | 1,500,000 | 300,000 | 5 | * | ..... | ..... | ..... | |
| 44 | Denver City, S. L. | Colo. | 5,000,000 | 500,000 | 10 | * | ..... | ..... | ..... | |
| 45 | Denver Gold, G. | Colo. | 300,000 | 60,000 | 5 | * | ..... | ..... | ..... | |
| 46 | Durango, G. | Colo. | 500,000 | 500,000 | 1 | ..... | ..... | ..... | ..... | |
| 47 | Eastern Dev. Co., Lt. | N. S. | 1,500,000 | 150 000 | 10 | 990,000 | Mar. | 1886 | 1.00 | |
| 48 | El Cristo, G. S. | U.S.C | 1,000,000 | 500,000 | 2 | * | ..... | ..... | ..... | |
| 49 | El Dorado, G. | Cal. | 1,000,000 | 250,000 | 4 | * | ..... | ..... | ..... | |
| 50 | El Talento, G. | U.S.C | 1,000,000 | 500,000 | 2 | ..... | ..... | ..... | ..... | |
| 51 | Empire, S. | Utah | 10,000,000 | 100,000 | 100 | * | ..... | ..... | ..... | |
| 52 | Eureka Tunnel, S. L. | Nev. | 10,000,000 | 100,000 | 100 | ..... | ..... | ..... | ..... | |
| 53 | Exchequer | Nev | 10,000,000 | 100,000 | 100 | 790,000 | Sept | 1888 | .20 | |
| 54 | Found Treasure, G. S. | Nev. | 10,000,000 | 100,000 | 100 | 18,030 | July | 1882 | .06 | |
| 55 | Gogebic L. Syn., I. | Wis. | 5,800,000 | 200,000 | 25 | * | ..... | ..... | ..... | |
| 56 | Gold Cup, S. | Colo. | 500,000 | 500,000 | 1 | * | ..... | ..... | ..... | |
| 57 | Golden Era, S. | Mon. | 2 000,000 | 200,000 | 10 | * | ..... | ..... | ..... | |
| 58 | Gold Placer, G. | Colo. | 5,000,000 | 200,000 | 25 | 229,314 | Dec. | 1885 | .25 | |
| 59 | Gold Rock, G. | Cal. | 10,000,000 | 100,000 | 2 | * | ..... | ..... | ..... | |
| 60 | Goodshaw, G. | Cal. | 10,000,000 | 100,000 | 100 | * | ..... | ..... | ..... | |
| 61 | Grand Belt, C. | Tex. | 12,000,000 | 120,000 | 100 | * | ..... | ..... | ..... | |
| 62 | Grand Duke | Colo. | 800,000 | 80,000 | 10 | * | ..... | ..... | ..... | |
| 63 | Great Remance, G. | U.S.C | 1,000,000 | 500,000 | 2 | * | ..... | ..... | ..... | |
| 64 | Gregory-Bobtail, G. | Colo. | 550,000 | 550,000 | 1 | * | ..... | ..... | ..... | |
| 65 | Gregory Con., G. | Mon. | 3,000,000 | 300,000 | 10 | ..... | ..... | ..... | ..... | |
| 66 | Harlem M. & M. Co., L. | Cal. | 1 000,000 | 200,000 | 5 | ..... | ..... | ..... | ..... | |
| 67 | Head Cent. & Tr. s. | Ariz. | 10,000,000 | 100,000 | 100 | ..... | ..... | ..... | ..... | |
| 68 | Hector, G. | Cal. | 1,500,000 | 300,000 | 5 | ..... | ..... | ..... | ..... | |
| 69 | Highland, C. | Mich | 500,000 | 25,000 | 25 | ..... | ..... | ..... | ..... | |
| 70 | Hollywood | Cal. | 200,000 | 100,000 | 2 | ..... | ..... | ..... | ..... | |
| 71 | Hortense, S. | Colo. | 2,000,000 | 200,000 | 10 | ..... | ..... | ..... | ..... | |
| 72 | Hurod, G. | Cal. | 10,000,000 | 100,000 | 25 | 280,000 | May | 1887 | 3.00 | |
| 73 | Iron Gold & Silver, S. | N. M. | 2,000,000 | 200,000 | 10 | * | ..... | ..... | ..... | |
| 74 | Ironton, I. | Wis. | 1,000,000 | 40,000 | 25 | * | ..... | ..... | ..... | |
| 75 | Iroquois, C. | Mich | 1,250,000 | 50,000 | 25 | * | ..... | ..... | ..... | |
| 76 | J. D. Reymert | Ariz. | 10,000,000 | 100,000 | 100 | * | ..... | ..... | ..... | |
| 77 | Julia Cons., G. S. | Nev. | 11,000,000 | 110,000 | 100 | 1,650,000 | Apl. | 1887 | .10 | |
| 78 | Kearsarge, C. | Mich | 1 250,000 | 50,000 | 25 | 190,000 | Oct. | 1887 | 1.00 | |
| 79 | Lacrosse, G. | Colo. | 1,000,000 | 100,000 | 10 | * | ..... | ..... | ..... | |
| 80 | Lee Basin, S. | Colo. | 5,000,000 | 500,000 | 10 | * | ..... | ..... | ..... | |
| 81 | Lucerne, S. | Colo. | 5,000,000 | 500,000 | 10 | * | ..... | ..... | ..... | |
| 82 | Mammoth Bar., G. | Cal. | 10,000,000 | 100,000 | 100 | 50,000 | Dec. | 1881 | ..... | |
| 83 | May Belle, G. | Cal. | 10,000,000 | 100,000 | 100 | 84,000 | Mar. | 1884 | .15 | |
| 84 | Mayflower Gravel, | Cal. | 1,000,000 | 100,000 | 10 | 425,000 | July | 1888 | .50 | |
| 85 | Modora, G. | Cal. | 250,000 | 250,000 | 1 | ..... | ..... | ..... | ..... | |
| 86 | Mexican, G. S. | Nev. | 10,000,000 | 100,000 | 100 | 2,725,700 | Aug. | 1888 | .25 | |
| 87 | Middle Bar G. | Cal. | 400,000 | 200,000 | 2 | * | ..... | ..... | ..... | |
| 88 | Mine & Starr, S. L. | Colo. | 1,000,000 | 200,000 | 5 | * | ..... | ..... | ..... | |
| 89 | Monitor, G. | Colo. | 100,000 | 100,000 | 1 | * | ..... | ..... | ..... | |
| 90 | Moose Silver, S. | Colo. | 3,000,000 | 300,

# NEW YORK MINING STOCKS QUOTATIONS.

## DIVIDEND-PAYING MINES.

| Name and Location of Company. | Oct. 27. | | Oct. 29. | | Oct. 30. | | Oct. 31. | | Nov. 1. | | No. 2 | | Sales. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | |
| Adams, Colo. | .... | ..... | .... | .... | ..... | .... | .... | ..... | 1.10 | .... | 1.10 | 1.05 | 700 |
| Alice, Mont | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Arzenta, Nev | .... | ..... | .... | .... | ..... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Bassick, Colo | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Belcher, Nev | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Belle Isle, Nev. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Bodie Cons., Cal. | .... | ..... | 2.10 | .... | .... | .... | 2.20 | .... | 2.15 | .... | .... | .... | 400 |
| Breece, Colo | .... | ..... | .... | .... | ..... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Bulwer, Cal | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Caledonia, Dak | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Calumet & Hecla | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Chollar, Nev | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Chrysolite, Colo. | .... | ..... | .... | .... | .30 | .... | .... | ..... | .... | .... | .... | .... | 200 |
| Colorado Cent'l, Colo. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Cons. Cal. & Va., Nev. | .... | ..... | .... | .... | 11.00 | .... | 11.00 | 10.88 | 10.75 | 10.50 | .... | .... | 800 |
| Crown Point, Nev | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Deadwood, Dak | .... | ..... | .... | .... | 1.60 | .... | 1.75 | 1.60 | 1.70 | .... | .... | .... | 500 |
| Dunkin, Colo. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Eureka Cons., Nev | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Father de Smet, Dak | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Freeland, Colo. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Gould & Curry, Nev. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Grand Prize, Nev. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Hale & Norcross, Nev | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | 6.00 | .... | 5 |
| Holyoke, Idaho | .... | ..... | .... | .... | .... | .06 | .... | ..... | .... | .... | .... | .... | 1,200 |
| Homestake, Dak. | .... | ..... | .... | .... | 11.50 | 11.25 | .... | ..... | .... | .... | .... | .... | 200 |
| Horn-Silver, Ut. | .... | ..... | .... | .... | .... | .... | .87 | .85 | .... | .... | .90 | .85 | 1,100 |
| Iron Hill, Dak. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Iron Silver, Colo. | .... | ..... | 3.50 | .... | 3.40 | .... | .... | ..... | .... | .... | 3.40 | .... | 1,050 |
| Leadville C., Colo. | 12 | ..... | .... | .... | .... | .... | .11 | .... | .... | .... | .... | .... | 1,000 |
| Little Chief, Colo. | .... | ..... | .... | .... | .... | .... | .... | ..... | .22 | .20 | .... | .... | 600 |
| Little Pittsburg, Colo | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Martin White, Nev. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Mono, Cal. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Mount Diablo, Nev. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Navajo, Nev. | 2.60 | ..... | 2.75 | 2.45 | 2.65 | .... | 2.70 | 2.60 | .... | .... | 2.50 | .... | 1,200 |
| North Belle Isle, Nev. | .... | ..... | .... | .... | .... | .... | .... | ..... | 2.40 | 2.35 | .... | .... | 300 |
| North Star, Cal. | .... | ..... | .... | .... | .... | .... | .... | ..... | 6.50 | .... | 6.50 | .... | 900 |
| Ontario, Ut. | 33.00 | ..... | .... | .... | .... | .... | .... | ..... | 33.50 | .... | 33.50 | .... | 139 |
| Ophir, Nev. | .... | ..... | 8.00 | .... | .... | .... | .... | ..... | 7.75 | .... | .... | .... | 300 |
| Plutus, Colo. | .90 | ..... | .90 | .... | .95 | .... | .95 | ..... | .93 | .... | .96 | .... | 2,900 |
| Plymouth, Cal. | .... | ..... | .... | .... | 9.00 | .... | 9.00 | .... | .... | .... | 9.50 | 9.00 | 1,900 |
| Quicksilver Pref., Cal | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| " Com., Cal | .... | ..... | .... | .... | 9.50 | .... | 9.50 | 9.25 | .... | .... | 9.63 | 9.50 | 500 |
| Robinson Cons. Colo. | .... | ..... | .... | .... | .80 | .75 | .... | ..... | .... | .... | .... | .... | 200 |
| Savage, Nev. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Sierra Nevada, Nev. | .... | ..... | .... | .... | .... | .... | .... | ..... | 4.10 | .... | .... | .... | 200 |
| Silver King, Ariz. | 1.75 | 1.65 | 1.60 | 1.55 | 1.60 | 1.50 | 1.70 | 1.60 | 1.65 | 1.50 | 1.60 | .... | 3,775 |
| Silver Mg. of L. V. | .... | ..... | .... | .... | .... | .... | .... | ..... | .24 | .22 | .25 | .... | 2,400 |
| Small Hopes, Colo. | .... | ..... | .... | .... | .... | .... | .... | ..... | 1.10 | 1.05 | 1.00 | .... | 500 |
| Standard, Cal | .... | ..... | 1.25 | .... | 1.40 | .... | .... | ..... | 1.55 | .... | 1.55 | .... | 500 |
| Stormont, Utah | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Yellow Jacket | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |

## NON-DIVIDEND-PAYING MINES.

| Name and Location of Company. | Oct. 27 | | Oct. 29 | | Oct. 30. | | Oct. 31. | | Nov. 1. | | Nov. 2 | | Sales. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | |
| Alta, Nev. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Amador, Cal. | 2.25 | .... | 2.25 | ..... | 2.25 | .... | 2.25 | .... | 2.25 | ..... | 2.25 | ..... | 1,000 |
| Am'can Flag, Colo. | .... | ..... | .... | ..... | .... | .... | .... | ..... | .... | ..... | .... | ..... | ..... |
| Astoria, Cal. | .24 | .... | .24 | .... | .24 | .... | .24 | .... | .24 | .... | .24 | .... | 6,000 |
| Barcelona, Nev. | ..... | .... | .80 | .79 | .80 | ..... | .78 | .75 | .... | .... | .75 | .... | 2,800 |
| Bechtel, Cal. | .... | ..... | .... | .... | .... | .... | ..... | ..... | .08 | .... | .... | .... | 500 |
| Best & Belcher, Nev. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Brunswick, Cal. | .... | ..... | .10 | .... | .... | .... | .... | ..... | .... | .... | .... | .... | 800 |
| Buffalo Iron Min'g. | .... | .... | .... | .... | .... | .... | .... | ..... | .... | .... | 6.00 | 5.38 | 800 |
| Bullion, Nev. | 2.25 | .... | .... | .... | .... | .... | .... | ..... | .... | .... | 2.20 | .... | 200 |
| Cashier, Colo | .... | ..... | .... | .... | .... | .14 | .... | ..... | .... | .... | .... | .... | 100 |
| Castle Creek, Id. | .06 | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .05 | .... | 2,300 |
| Central Aizona | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Cleveland, Dak. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Colchis, N. M. | 2.30 | 2.25 | 2.20 | 2.15 | 2.20 | .... | 2.25 | .... | 2.25 | .... | .... | .... | 630 |
| Columbia & Beaver | .... | .... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Con. Imperial, Nev | .... | ..... | .... | .... | 1.00 | .... | 1.00 | .97 | .97 | .... | .... | .... | 2,300 |
| Con. Pacific | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Deer Creek, Idaho | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Eastern Oregon | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| El Cristo, U. S. Col. | .... | ..... | .... | .... | .... | .... | .74 | .... | .... | .... | .... | .... | 250 |
| Exchequer, Nev. | 1.80 | .... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | 50 |
| Found Treas'e, Nev. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Hollywood, Cal. | .41 | .40 | .40 | .... | .40 | .... | .41 | .... | .40 | .... | .41 | .40 | 5,400 |
| Huron, Mich. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Julia, Nev. | .55 | .... | .... | .... | .... | .... | .... | ..... | .55 | .... | .... | .... | 400 |
| Kingst'n & Pemb'ke | 2.00 | .... | .... | .... | 2.00 | .... | 2.00 | 1.88 | 1.63 | 1.00 | 1.25 | 1.00 | 3,067 |
| Kossuth, Nev. | .12 | .... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | 1,400 |
| Lacrosse, Colo | .... | ..... | .10 | ..... | .10 | .... | .... | ..... | .... | .... | .... | .... | 1,000 |
| Lee Basin, Colo. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Mexican, Nev. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Middle Bar, Cal. | .40 | ..... | .40 | ..... | .41 | ..... | .42 | .41 | .41 | ..... | .41 | ..... | 3,100 |
| Moniter, Colo. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| N'th Standard, Cal | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Oriental & Miller | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Phœnix Lead, Colo. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Phœnix of Ark. | .... | ..... | .... | .... | .... | .... | .... | ..... | .30 | .25 | .25 | .... | 900 |
| Rappahann'k, Va. | .10 | .... | .10 | .... | .10 | .... | .10 | .... | .10 | .... | .... | .... | 2,300 |
| San Sebastian, S'nS | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Santiago, U. S. Col. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Shoshone, Idaho | .... | ..... | .... | .... | .... | .10 | .... | ..... | .10 | .... | .... | .... | 2,600 |
| Silver Cliff, Colo. | .06 | ..... | .... | .... | .... | .07 | .... | ..... | .... | .... | .... | .... | 1,400 |
| Silver Cord, Colo. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Silver Queen, Ariz. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| State Line t&s, Nev | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| " 2&3, " | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Sutro Tunnel, Nev. | .14 | .09 | .13 | .... | .12 | .10 | .15 | .12 | .11 | ..... | .10 | .... | 28,545 |
| " Trust Cert. | 70.00 | 68.00 | 69.00 | ..... | 68.00 | ..... | 68.00 | .... | .... | ..... | 68.00 | .... | 5,500 |
| Sutter Creek, Cal. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| SylvaniteM. & M. Co. | 3.00 | .... | .... | .... | 3.00 | .... | 3.10 | .... | .... | .... | .... | .... | 700 |
| Tornado, Nev. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | .... | .... | .... | ..... |
| Union Cons., Nev. | 4.25 | .... | .... | .... | .... | .... | .... | ..... | 4.15 | .... | .... | .... | 200 |
| United Copper | .... | ..... | 1.25 | 1.20 | 1.15 | .... | 1.25 | ..... | 1.25 | 1.20 | 1.20 | .... | 515 |

*Ex. dividend † Dealt in the New York Stock Ex. Unlisted Securities ‡Assessment unpaid. Dividend shares sold, 23,169. Non-dividend shares sold, 76,347. Total New York, 99,516.

# BOSTON MINING STOCK QUOTATIONS.

| Name of Company | Oct. 26. | | Oct. 27. | | Oct. 29. | | Oct. 30. | | Oct. 31. | | Nov. 1. | | Sales. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Atlantic, Mich. | 18.75 | ..... | 19.00 | .... | 19.00 | 18.75 | 19.00 | 18.88 | 19.00 | ..... | 19.50 | .... | 940 |
| Bodie, Cal. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Bonanza Developm't | 1.63 | ..... | 1.63 | .... | 1.63 | .... | 1.63 | ..... | 1.63 | ..... | 1.75 | .... | 1,400 |
| Bost. & Mont., Copper | 64.75 | 62.50 | 69.00 | 64.50 | 70.00 | 68.50 | 70.00 | 68.50 | 70.00 | 68.50 | 72.50 | 70.00 | 16,357 |
| Breece, Colo. | .... | ..... | .... | .... | .... | .... | .... | ..... | .33 | ..... | .32½ | .... | 700 |
| Calumet & Hecla | 307 | 300 | 305 | 303 | 310 | 308 | 309 | 307 | 307 | 303 | 324 | 305 | 796 |
| Catalpa, Colo. | .... | ..... | .17 | ..... | .20 | .... | .18 | ..... | .18 | ..... | .... | .... | 2,400 |
| Central, Mich. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Chrysolite, Colo. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Con. Cal. & Va., Nev. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Dunkin, Colo. | .95 | ..... | .... | .... | .95 | .... | .97 | .95 | .95 | ..... | .... | .... | 950 |
| Enterprise. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Franklin, Mich. | 18.00 | ..... | .... | .... | 18.50 | .... | 19.00 | 18.50 | 18.50 | 18.25 | 19.25 | 18.50 | 495 |
| Hale & Norcross, Nev. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Honorine, Utah. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Little Chief, Colo. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Little Pittsburg, Colo. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Martin White, Nev. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Mono, Cal. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Napa, Cal. | .... | ..... | .... | .... | .... | .... | .... | ..... | 1.88 | ..... | .... | .... | 200 |
| Ontario. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Osceola, Mich. | 21.50 | ..... | 22.00 | 21.25 | 23.00 | 22.25 | 22.50 | 22.00 | 22.00 | .... | 22.50 | 22.00 | 1,085 |
| Pewabic, Mich. | .... | ..... | .... | .... | 4.75 | .... | .... | ..... | .... | ..... | 4.75 | .... | 300 |
| Quincy, Mich. | .... | ..... | 87.50 | ..... | .... | .... | 85.00 | .... | .... | .... | 88.00 | .... | 56 |
| Ridge, Mich. | 2.88 | 2.63 | 2.75 | .... | 2.50 | ..... | 2.50 | .... | .... | ..... | .... | .... | 500 |
| Sierra Nev., Nev. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Silver King, Ariz. | .... | ..... | .... | .... | 1.88 | ..... | .... | ..... | .... | ..... | .... | .... | 50 |
| Standard, Cal. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Tamarack, Mich. | 177 | 175 | .... | .... | 180 | 179 | .... | ..... | .... | ..... | 180 | .... | 93 |

| Name of Company. | Oct. 26. | | Oct. 27. | | Oct. 29. | | Oct. 30. | | Oct. 31. | | Nov. 1. | | Sales |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Allouez, Mich. | 5.50 | 5.13 | 5.75 | 5.25 | 5.75 | 5.50 | 5.50 | .... | 5.63 | 5.13 | 5.60 | .... | 4,020 |
| Arnold, Mich. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .30 | ..... | 100 |
| Aztec, Mich. | .... | ..... | .... | .... | .... | .... | .20 | ..... | .15 | ..... | .15 | ..... | 800 |
| Brunswick, Cal. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Canada. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Cashier, Colo. | .04 | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Crescent, Colo. | .11 | ..... | .... | .... | .... | .... | .... | ..... | .10 | ..... | .... | .... | 500 |
| Cusi, N. Mex. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | 800 |
| Denver City, Colo. | .... | ..... | .... | .... | .... | .... | .... | ..... | .10 | ..... | .... | .... | ..... |
| Everett. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | 100 |
| Hanover, Mich. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Humboldt, Mich. | .... | ..... | .... | .... | .... | .... | .... | ..... | .16 | ..... | .... | ..... | 100 |
| Hungarian | .... | ..... | .... | .... | .20 | ..... | .... | ..... | .... | ..... | .... | .... | 100 |
| Huron, Mich. | .... | ..... | 7.00 | .... | 7.13 | .... | 7.25 | ..... | .... | ..... | 7.50 | 7.13 | 900 |
| Kearsarge, Mich. | 13.50 | 13.00 | 14.00 | 13.50 | 13.75 | 13.50 | 13.63 | 13.50 | 13.00 | ..... | 14.00 | 13.13 | 3,505 |
| Mesnard, Mich. | .70 | ..... | .... | .... | .... | .... | .... | ..... | .50 | ..... | .50 | ..... | 400 |
| National, Mich. | 8.13 | 7.75 | 9.00 | 8.50 | 9.00 | 8.75 | 8.38 | 8.00 | 8.50 | 8.00 | 8.75 | 8.00 | 5,205 |
| Native, Mich. | .20 | ..... | .... | .... | .... | .... | .... | ..... | .15 | ..... | .17 | ..... | 800 |
| Oriental & M., Nev. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Pontiac. | .60 | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | 200 |
| Rappahannock, Va. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Rockland. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Security, Colo | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| Shoshone, Idaho | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| South Side, Mich. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| St. Louis Cop. | .... | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | ..... |
| St. Mary's | .30 | ..... | .... | .... | .... | .... | .... | ..... | .30 | ..... | .... | .... | 200 |
| Washington | .25 | ..... | .... | .... | .... | .... | .... | ..... | .... | ..... | .... | .... | 300 |
| Winthrop, Mich. | .... | ..... | .... | .... | .... | .... | .... | ..... | .20 | ..... | .... | .... | 100 |

Boston: Dividend shares sold, 29,252. Non-dividend shares sold, 18,130. Total Boston, 47,382.

# COAL STOCKS.

| Name of Company. | Par val. of sh'rs. | Oct. 27. | | Oct. 29. | | Oct. 30. | | Oct. 31. | | Nov. 1. | | Nov. 2. | | Sales. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | |
| American Coal. | .... | ..... | .... | ..... | .... | 40 | .... | ..... | .... | ..... | .... | ..... | .... | 65 |
| Barclay Coal. | .... | ..... | .... | ..... | .... | ..... | .... | ..... | .... | ..... | .... | ..... | .... | ..... |
| Cameron Coal & Iron Co | .... | ..... | .... | ..... | .... | ..... | .... | ..... | .... | ..... | .... | ..... | .... | ..... |
| Ches. & O. RR. | 100 | ..... | .... | ..... | .... | ..... | .... | ..... | .... | ..... | .... | ..... | .... | ..... |
| Chic. & Ind. Coal RR. | 100 | ..... | .... | ..... | .... | ..... | .... | ..... | .... | ..... | .... | ..... | .... | ..... |
| Do. pref. | 100 | ..... | .... | ..... | .... | ..... | .... | ..... | .... | ..... | .... | ..... | .... | ..... |
| Col. & Hocking Coal | 100 | ..... | .... | 21¼ | ..... | 20¼ | 20⅛ | 21 | 20 | ..... | .... | ..... | .... | 410 |
| Col., C. & I | 100 | ..... | .... | 34¾ | 34⅜ | 34½ | ..... | ..... | ..... | ..... | .... | ..... | .... | 1,650 |
| Consol. Coal. | 100 | ..... | .... | ..... | .... | ..... | .... | 23½ | ..... | ..... | .... | ..... | .... | 100 |
| Del. & H. C. | 100 | 119¼ | ..... | 118½ | 118 | 118⅛ | 117⅜ | 118⅝ | 118¼ | 118¾ | 118¼ | 118½ | 118½ | 2,766 |
| D., L. & W. RR. | 50 | 139⅜ | 139⅛ | 139 | 138 | 138⅛ | 137⅞ | 139 | 138½ | 139⅜ | 138⅛ | 139⅝ | 138¾ | 21,620 |
| Hocking Valley. | 100 | 27 | 26¼ | 25⅝ | 25 | 25⅜ | 25⅛ | ..... | ..... | 27 | 26½ | ..... | ..... | 1,895 |
| Hunt. & Broad Top | .... | ..... | ..... | ..... | ..... | 20 | 19¾ | ..... | ..... | ..... | ..... | ..... | ..... | 300 |
| Do. pref. | .... | ..... | ..... | 45½ | ..... | 45¼ | ..... | ..... | ..... | 45¾ | ..... | ..... | ..... | 310 |
| Lehigh C. & N. | 50 | ..... | ..... | 51⅛ | ..... | 51⅛ | ..... | 51½ | 51¼ | 51½ | 51⅜ | ..... | ..... | 313 |
| Lehigh & W. B. Coal. | .... | ..... | ..... | ..... | ..... | 30 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 100 |
| Lehigh Valley RR. | 50 | 54 | ..... | 54¼ | 53⅞ | 53⅞ | ..... | 53⅞ | ..... | 53⅞ | 53¾ | ..... | ..... | 666 |
| Mahoning Coal RR. | 100 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Do. pref. | .... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Marshall Con. Coal. | 100 | 18¾ | 18½ | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 200 |
| Maryland Coal. | 100 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Montauk Coal. | 50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Morris & Essex. | 100 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| New Central Coal. | 100 | ..... | ..... | ..... | ..... | ..... | ..... | 11½ | ..... | ..... | ..... | ..... | ..... | 100 |
| N. J. C. RR. | 50 | ..... | ..... | 88¾ | 88 | 88½ | 87¾ | 89 | 88 | 90¼ | 88¾ | 90½ | 89½ | 8,053 |
| N. Y. & S. Coal. | 100 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| N. Y., Susq. & Western | 100 | ..... | ..... | 10 | ..... | 9¾ | 9½ | ..... | ..... | 9⅞ | 9½ | 9⅝ | ..... | 361 |
| Do. pref. | 100 | ..... | ..... | 35 | 34¾ | 34½ | 34 | 34⅞ | 34¾ | 34⅝ | 34⅜ | 34¾ | 34⅝ | 2,898 |
| N. Y. & Perry C. & I. | 100 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Norfolk & Western R.R. | 100 | 18¼ | 18 | 18½ | 17 | 18½ | 17¼ | ..... | ..... | 18 | ..... | ..... | ..... | 1,086 |
| Do. pref. | 50 | 51¾ | 51⅝ | 51¼ | 51⅛ | 51⅝ | 50⅞ | 51½ | ..... | 52⅛ | 51⅞ | 51¾ | ..... | 6,069 |
| Penn. Coal. | 50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Penn. RR. | 50 | 55¾ | ..... | 55¾ | 55½ | 55½ | 55⅛ | 55⅛ | 55¼ | 55⅛ | 55¼ | ..... | ..... | 4,758 |
| Ph. & R. RR.** | 50 | 51¾ | 50⅝ | 50⅝ | 49 | 49¼ | 48⅛ | 49¾ | 49 | 50¾ | 49⅛ | 50⅝ | 49¼ | 316,340 |
| Tennessee C. & I. Co. | 100 | 33 | 32½ | 32⅝ | 32 | 32½ | 31⅞ | 33⅛ | 32⅜ | 33¼ | 33 | 33⅜ | 33 | 9,050 |
| Do. Pref. | .... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 94¼ | ..... | 94 | ..... | 330 |
| Westmoreland Coal. | 100 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | *65½ | ..... | ..... | ..... | ..... |
| Wyoming Valley Coal | .... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

*Bid. †Asked.

**Of the sales of this stock, 71,350 were in Philadelphia, and 244,900 in New York. Total sales, 379,440.

## San Francisco Mining Stock Quotations.

| Company. | Closing Quotations. Oct. 26. | Oct. 27. | Oct. 29. | Oct. 30. | Oct. 31. | Nov. 1. |
|---|---|---|---|---|---|---|
| Alpha | .... | ..... | ..... | ..... | ..... | ..... |
| Alta. | 2.25 | 3.00 | 2.80 | 3.00 | 3.25 | 3.40 |
| Belcher. | .... | ..... | ..... | ..... | ..... | ..... |
| Belle Isle. | .55 | .55 | .55 | .55 | .50 | .50 |
| Best & Bel. | 8.00 | 8.38 | 7.75 | 7.75 | 7.38 | 8.50 |
| Bodie. | 2.20 | 2.15 | 2.25 | 2.10 | 2.05 | 2.05 |
| Bulwer. | .75 | .70 | .75 | .73 | .60 | .70 |
| Chollar. | 3.80 | 4.10 | 3.80 | 3.65 | 3.55 | 4.00 |
| C'm'weal'h | 3.90 | 3.00 | 3.70 | 3.00 | ..... | 3.50 |
| Con. C. & V | 11.13 | 11.13 | 10.88 | 11.13 | 10.25 | 11.00 |
| Con. Pac. | .... | ..... | ..... | ..... | ..... | ..... |
| Crown Pt. | 8.00 | 7.75 | 8.00 | 7.75 | 7.50 | 7.75 |
| Eureka C. | .... | ..... | ..... | ..... | ..... | ..... |
| Gould & C. | 4.65 | 5.13 | 4.65 | 5.13 | 4.50 | 4.90 |
| Grd. Prize. | .... | ..... | ..... | ..... | ..... | ..... |
| Hale & N. | 6.25 | 6.38 | 6.25 | 6.38 | 6.13 | 6.38 |
| Mexican. | 5.00 | 5.00 | 5.00 | 5.00 | 4.80 | 4.75 |
| Mono. | 1.65 | 1.65 | 1.65 | 1.65 | 1.30 | 1.65 |
| Mt. Diablo | .... | ..... | ..... | ..... | ..... | ..... |
| Navajo. | 2.60 | 2.60 | 2.60 | 2.60 | 2.60 | 2.70 |
| Nev. Queen | 3.20 | ..... | 3.20 | ..... | 3.00 | ..... |
| N. Belle I. | 2.50 | ..... | 2.50 | ..... | 2.50 | 2.25 |
| Ophir. | 8.00 | 7.63 | 8.00 | 7.63 | 7.75 | 8.13 |
| Potosi. | 3.60 | 3.50 | 3.00 | 3.50 | 3.35 | 4.25 |
| Savage. | 4.95 | 5.00 | 4.95 | 5.00 | 4.65 | 5.38 |
| Scorpion | .... | ..... | ..... | ..... | ..... | ..... |
| Sierra Nev. | 4.50 | 4.40 | 4.50 | 4.40 | 4.20 | 4.65 |
| Sutro Tun. | ..... | ..... | ..... | ..... | ..... | ..... |
| Tip Top. | .... | ..... | ..... | ..... | ..... | ..... |
| Union Con. | 4.40 | 4.40 | 4.40 | 4.40 | 4.20 | 4.55 |
| Utah. | 1.55 | 1.50 | 1.55 | 1.50 | 1.50 | 1.60 |
| Yellow Jkt. | 7.00 | 6.63 | 7.00 | 6.63 | 6.38 | 7.13 |

later advanced again to $2.25. Silver Mining of Lake Valley sold at from 22@24c.

There is absolutely nothing doing in El Cristo, and there was only one quotation at 74c.

Castle Creek and Holyoke remained at 6c. No sales were made in Deer Creek.

The feature of the week was the decline in Kingston & Pembroke, which went from $2 to $1, at which price sales were made to-day. Some 3057 shares were sold during the week.

North Star of California sold at $6.50.

Deadwood shows a small business at from $1.60 to $1.75. Homestake at from $11.25 to $11.50.

The Sylvanite Mining and Milling Company, the stock of which was placed among the unlisted securities of the New York Stock Exchange, and not at the Consolidated Stock and Petroleum Exchange, as erroneously reported last week, was incorporated under the laws of the State of Colorado, April 11th, 1888, with a capital stock of $5 000,000, divided into 500,000 shares of $10 each, non-assessable. The stock is registered with the Farmers' Loan and Trust Company, of New York City. The officers are: Norvin Green, President; Richard J. Morrison, Secretary; Theo. E. Leeds, Treasurer. The board of directors is as follows: J. P. Branch, P. T. Wall, W. A. Clark, R. A. Elmer, Norvin Green, W. H. Wilson, Theo. E. Leeds, W. J. Baker, G. P. Hawes. The capacity of the milling and mining machinery is 50 tons per day, and it is stated that $50.000 has been expended in surface work and $125,000 underground at the mine. The stock has been selling at from $3@$3.10. Adams, in which little is now doing, sold at from $1.05@$1.10; Iron Silver at from $3.40@$3.50; Chrysolite at 30c.; Leadville at 12c.; Little Chief at from 20@22c. Plutus advanced from 90@96c. Robinson was quoted at from 75@80c. Small Hopes went from $1.10@$1; Cashier at 14c.; Lacrosse at 10c.

An important meeting of the stockholders of the rejuvenated "Security," otherwise known as the Geyser Mining and Milling Company, was held in Boston, but what was transacted thereat has not been made public as yet.

The process of reorganization, we are informed, was quite simple. The stockholders who paid the "voluntary contribution" of twenty-five cents per share last summer accepted the company's notes for the amounts "contributed." Being thus the creditors of the company, the stockholders who had contributed were afterwards enabled to sue for the faces of the notes. The suits were brought and full judgment obtained. The property was then sold by the sheriff for debt; representatives of the old stockholders bought it, and the Geyser Mining and Milling Company was formed. This is the story as told us by one of the present directors. We are furthermore assured that "Dr." R. C. Flower is no longer connected with the enterprise.

### Auction Sale of Stocks.

At the Real Estate Exchange on the 31st ult., A. H. Muller & Son sold at public auction 2 shares Consolidated Electric Light Company, at $51 per share. A lot of mining stock, including 700 shares Trinity Hydraulic Gold Mining Company, par value $10 each; 100 shares Hukill Gold and Silver Mining Company of N. Y., par value $5 each; 100 shares Fortuna Gold Mining Company, of Nevada County, Cal., par value $10 each, brought $8 for the entire lot; 200 shares of the Aspen Mining and Smelting Company, of the par value of $10 each, were sold at $8 per share; 20 shares of the Gas Consumers' Benefit Company brought $35.

### Pipe Line Certificates.

Messrs. Watson & Gibson, brokers, report as follows for the week:

The petroleum market this week has not been marked by any special features of interest. Speculation in it is limited at present, and the public disinclined to come into the market on account of the recent severe break, which to them is inexplicable. With the stocks of oil falling off each month as they are, and with no new field in sight in Pennsylvania, and with no important utilization of high oil, but, on the contrary, an increased consumption throughout the world of American petroleum, we consider it a very cheap commodity at the present price.

NEW YORK STOCK EXCHANGE.

| | Opening. | Highest. | Lowest. | Closing. | Sales. |
|---|---|---|---|---|---|
| Oct. 27..... | 85¾ | 86⅝ | 85¾ | 85¾ | 225,000 |
| 29..... | 85¾ | 86 | 83½ | 84 | 839,000 |
| 30..... | 83¼ | 85 | 82½ | 84⅝ | 1,282,000 |
| 31..... | 84⅝ | 85⅝ | 83⅞ | 85½ | 626,000 |
| Nov. 1..... | 85 | 85⅝ | 82¾ | 83½ | 903,000 |
| 2..... | 83⅜ | 84⅜ | 82⅞ | 84 | 699,000 |
| Total sales in barrels..... | | | | | 4,574,000 |

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

| | Opening. | Highest. | Lowest. | Closing. | Sales. |
|---|---|---|---|---|---|
| Oct. 27..... | 86 | 86⅝ | 85¾ | 85¾ | 333,000 |
| 29..... | 85¾ | 85⅞ | 83⅜ | 83¾ | 1,462,000 |
| 30..... | 83⅜ | 85 | 82 | 84½ | 2,328,000 |
| 31..... | 84¾ | 85¾ | 83⅞ | 85¼ | 1,460,000 |
| Nov. 1..... | 84⅞ | 85 | 82⅝ | 83¼ | 1,416,000 |
| 2..... | 83⅛ | 84⅝ | 82⅞ | 84⅛ | 1,697,000 |
| Total sales in barrels..... | | | | | 8,676,000 |

### Meetings.

Agogebic Exploring, Mining and Manufacturing Company, 154 Second street, Milwaukee, Wis., November 20th, at two o'clock P.M.

California Water and Mining Company, No. 47 Broadway, New York City, November 15th, at twelve o'clock noon.

Colorado Central Consolidated Mining Company, Rooms 28 and 29, No. 48 Exchange Place, New York city, November 8th, at eleven o'clock A.M.

Conrad Consolidated and North Range Mining companies, both of Michigan, at the office of F. O. Clark, Marquette, Mich., November 27th, at ten o'clock A.M. and two o'clock P.M. respectively.

Tobin Exploring, Mining and Manufacturing Company, No. 154 Second street, Milwaukee, Wis., November 20th, at half-past seven o'clock A.M.

### Dividends.

The Idaho Quartz Mining Company, of California, will declare its usual monthly dividend, No. 229, on the 6th inst.

Mammoth Mining Company, of Utah, dividend No. 6, $10,000, payable November 15th at No. 251 South Main street, Salt Lake City, Utah.

Marshall Consolidated Coal Mining Company, of Colorado, will pay the coupons due November 1st of the first-mortgage and the debenture bonds on and after that date at the Farmers' Loan and Trust Company, New York.

### Assessments.

| COMPANY. | No. | When levied. | D'l'nq't in office. | Day of Sale. | Amn't per share. |
|---|---|---|---|---|---|
| Alta, Nev..... | 38 | Sept. 28 | Nov. 5 | Nov. 26 | .50 |
| Amer. Eagle, Cal.... | 1 | Sept. 20 | Oct. 25 | Nov. 15 | .10 |
| Anchor, Utah..... | 8 | Sept. 28 | Nov. 3 | Nov. 20 | .10 |
| Andes, Nev..... | 34 | Oct. 5 | Nov. 12 | Dec. 3 | .25 |
| Baltimore, Nev..... | 3 | Sept. 22 | Oct. 25 | Nov. 13 | .25 |
| Belcher, Nev..... | 36 | Sept. 18 | Oct. 23 | Nov. 12 | .50 |
| Best & Belcher, Nev. | 41 | Oct. 16 | Nov. 21 | Dec. 11 | .25 |
| Bodie, Cal..... | 9 | Sept. 24 | Oct. 29 | Nov. 30 | .50 |
| Caledonia, Nev..... | 43 | Oct. 19 | Nov. 21 | Dec. 12 | .15 |
| Chollar, Nev..... | 26 | Oct. 8 | Nov. 13 | Dec. 5 | .50 |
| Crown Point, Nev .. | 50 | Oct. 2 | Nov. 5 | Nov. 26 | .50 |
| Cons. Imperial, Nev. | 25 | Oct. 16 | Nov. 21 | Dec. 12 | .05 |
| Del. Monte, Nev..... | 1 | Oct. 15 | Nov. 20 | Dec. 12 | .25 |
| Empire, Cal..... | 1 | Sept. 19 | Oct. 22 | Nov. 8 | .25 |
| Exchequer, Nev..... | 26 | Sept. 6 | Oct. 10 | Oct. 31 | .20 |
| General Crook, Dak. | 5 | Oct. 12 | Dec. 1 | Dec. 20 | .002 |
| Golden Reward, Dak. | 3 | Oct. 14 | Nov. 21 | Dec. 8 | .02 |
| Gould & Curry, Nev | 60 | Oct. 4 | Nov. 9 | Nov. 30 | .30 |
| Grand Prize, Nev... | 19 | Oct. 12 | Nov. 17 | Dec. 5 | .25 |
| Horseshoe Bar Cons., Cal..... | 1 | Oct. 9 | Nov. 17 | Dec. 10 | .25 |
| Iron Hill, Dak..... | 14 | Sept. 15 | Oct. 17 | Nov. 3 | .03 |
| Justice, Nev..... | 47 | Sept. 25 | Oct. 31 | Nov. 19 | .25 |
| Keyes, Nev..... | 3 | Oct. 22 | Nov. 24 | Dec. 15 | .25 |
| Mikado, Dak..... | 1 | Sept. 25 | Oct. 27 | Nov. 17 | .002 |
| Montrose, Colo..... | 1 | Oct. 3 | Nov. 12 | Dec. 15 | .01½ |
| Mono, Cal..... | 26 | Sept. 20 | Oct. 23 | Nov. 28 | .50 |
| Mayflower, Nev..... | 43 | Oct. 16 | Nov. 16 | Dec. 10 | .50 |
| North Belle Isle, Nv. | 13 | Oct. 23 | Nov. 27 | Dec. 19 | .50 |
| N. Commonw'th, Nv. | 1 | Oct. 15 | Nov. 19 | Dec. 11 | .30 |
| Potosi..... | 31 | Oct. 1 | Nov. 6 | Nov. 27 | .50 |
| Ross Hannibal, Dak. | 3 | Sept. 25 | Oct. 27 | Nov. 17 | .002 |
| Russell, Cal..... | 3 | Oct. 18 | Nov. 26 | Dec. 17 | .10 |
| Savage, Nev..... | 71 | Oct. 4 | Nov. 7 | Nov. 27 | .50 |
| Seabury Calkins, Dak..... | 10 | Oct. 15 | Nov. 20 | Dec. 10 | .06½ |
| Spruce Gulch, Dak.. | 3 | Sept. 19 | Oct. 25 | Nov. 10 | .001 |
| Tuscarora, Nev..... | 1 | Oct. 1 | Nov. 4 | Dec. 5 | .05 |
| Union, Utah..... | ... | Sept. 12 | Oct. 20 | Nov. 10 | .005 |
| Utah, Nev..... | 5 | Oct. 4 | Nov. 8 | Nov. 26 | .25 |
| Virginia Creek, Cal. | 6 | Aug. 29 | Oct. 9 | Oct. 29 | .06 |
| Wall St., Dak..... | 1 | Sept. 20 | Oct. 22 | Nov. 15 | .001½ |

### Boston Mining Stocks. Nov. 1.

[From our Special Correspondent.]

The copper stocks have been fairly active the past week, but the activity has been confined largely to two or three of the strong dividend stocks, while there has been less disposition to trade in the low-priced shares. There is, however, a strong undertone to the whole market, and prices to-day are the highest for the week, with Calumet & Hecla and Boston & Montana as leaders, the former selling up to its highest price as yet, viz, $324, with a reaction to $320 in the later dealings. Boston & Montana touched $72½, reacting to $71. Its friends claim that it is worth $100 and predict that it will sell at that figure ere the close of the year. Application has been made to the Stock Exchange to list the stocks and bonds of the Butte & Boston Mining Company—200,000 shares of stock and $1,000,000 7 per cent bonds. Tamarack declined to $175 in the early dealings, but recovered and was strong to-day at $180.

Kearsarge was in better demand and the orders to buy coming from good houses advanced the price to $14.

Franklin continues to rule dull at $18½ to $19. The transactions in this stock have been very light, and the demand for it seems to have died out. Its near neighbor, the National, advanced on the favorable reports of some of the brokers who have recently visited the mine, and sold up to $9, losing only a $¼ in the later dealings. There has been more inquiry for Atlantic, and it has been quite firm at $18¾ to $19¼ all the week.

Osceola shows an improvement over last week of $1¼, with sales at $21½ to $23, losing the $¼ in the latest dealings.

Allouez was very firm at $5¾ early in the week, but declined to $5½ and rallied again to $5¾ to-day, and is very firm. At the present price we consider it a first-class purchase.

The balance of the list has been dull and neglected. We note sales of Huron at $7¼ (200 shares only), Ridge at $2⅝@$2½, Pewabic at $4¾, Mesnard at 50c., Bonanza $1⅝@$1¾.

Silver stocks continue dull and neglected, the interest of the market being centered in the coppers, which afford greater margin for profits, as well as having the advantage of being active. We note sales of Dunkin at 95c.@$1. Catalpa at 20c., and Napa Quicksilver at $1⅞.

LATER PRICES.

(*By Telegraph.*)- November 2d, 1 P.M.—Allouez, $5½; Boston & Montana, $72; Calumet & Hecla, $315; Kearsarge, $13½; National, $8⅞; Pewabic, $5; Tamarack, $181; Osceola, $22½.


## For Nervousness

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## ADVERTISING RATES.

## Of the Engineering and Mining Journal.

No deviation whatever from the rates given herewith will be allowed except to educational institutions.

(NONPAREIL MEASUREMENT.)

| | Lines. | Inches. | One issue. | 1 Month (4 issues). | 3 Months (13 issues). | 6 Months (26 issues). | 9 Months (39 issues). | 12 Months. (52 issues.) |
|---|---|---|---|---|---|---|---|---|
| | 6 | ½ | $1.50 | $4.23 | $11.64 | $20.60 | $28.29 | $34.35 |
| | 9 | | 2.25 | 5.84 | 15.54 | 27.63 | 37.71 | 47.17 |
| | 12 | 1 | 3.00 | 7.46 | 20.04 | 34.70 | 47.03 | 60.00 |
| | 15 | | 3.66 | 9 28 | 24.49 | 42 42 | 57.49 | 73.85 |
| | 18 | 1½ | 4.33 | 10.78 | 28 95 | 50.14 | 67.96 | 86.70 |
| | 21 | | 5.00 | 12 41 | 33.41 | 57.86 | 78 42 | 100.05 |
| | 24 | 2 | 5.67 | 14 10 | 37.87 | 65.59 | 88.89 | 113.40 |
| | 27 | | 6.29 | 15.58 | 41.85 | 72 48 | 98 23 | 125.32 |
| | 30 | 2½ | 6.88 | 17.07 | 45.83 | 79.38 | 107.58 | 137.25 |
| ¼ Column. | 33 | | 7.45 | 18.55 | 49.81 | 86.23 | 116.93 | 149.17 |
| | 36 | 3 | 8.05 | 20.04 | 53.80 | 93.18 | 120.28 | 161.10 |
| | 39 | | 8.58 | 21.37 | 57.38 | 99.38 | 134.68 | 171.82 |
| | 42 | 3½ | 9.12 | 22.70 | 60.97 | 105.58 | 143.09 | 182.55 |
| | 45 | | 9.66 | 24.03 | 64.55 | 111.78 | 151.49 | 193.27 |
| | 48 | 4 | 10.20 | 25.37 | 68.14 | 117.99 | 159.90 | 204.00 |
| | 54 | 4½ | 11.17 | 27.79 | 74.64 | 129.27 | 175.19 | 223.50 |
| | 60 | 5 | 12.15 | 30.22 | 81.15 | 140.55 | 190.48 | 243.00 |
| ½ Column. | 66 | 5½ | 13.03 | 32.46 | 87.16 | 150.96 | 204.58 | 261.00 |
| | 72 | 6 | 13.95 | 34.70 | 93.18 | 161.37 | 218.69 | 279 00 |
| | 78 | 6½ | 14.81 | 36.81 | 98.84 | 171.17 | 231.97 | 295.95 |
| | 84 | 7 | 15.74 | 38.92 | 104.50 | 180.97 | 245.26 | 312.90 |
| | 90 | 7½ | 16.51 | 40.95 | 109.99 | 190.42 | 258.09 | 329.25 |
| | 96 | 8 | 17.28 | 42.99 | 115.42 | 199.87 | 270.81 | 345.61 |
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